SPOKANE TRANSIT AUTHORITY

# FACILITIES MASTER PLAN

SPOKANE, WASHINGTON


## *MASTER PLAN REPORT - DRAFT*

MAY 2025

ALSC ARCHITECTS

COFFMAN ENGINEERS

We bring our clients' stories to life.


# TABLE OF CONTENTS

# 1.0 INTRODUCTION

# 1.1 EXECUTIVE SUMMARY

The purpose of this Facilities Master Plan is to provide Spokane Transit's decision makers with a tool to guide and initiate near and long-term facilities projects that enhance the next 25 years of Spokane Transit Authority (STA) operations. Building upon the foundations laid by Spokane Transit's *Connect 2035* plan, the 2015 *Administrative and Maintenance Facility Master Plan*, and the *Transit Development Plan: 2024-2029*, this document aims to address current space deficits, future growth expansion, and a transition to a zero-emissions fleet.

To do so, Spokane Transit's current operations and inventory of existing facilities were analyzed to identify inefficiencies and space needs based on growth factors projected out to 2050. Future operations models were then explored to determine the preferred approach most aligned with the guiding principles outlined on the facing page. Through these explorations, it became clear that Spokane Transit's future needs require expansion beyond the Boone Campus and onto Spokane Transit-owned and/or newly acquired property. Various sites upon which expansion could take place were analyzed and scored with respect to factors such as location, available infrastructure, and ease of acquisition.

The preferred approach, called the "Modified Network", allows for expansion to be shaped differently depending on the timing, availability and size of properties that make up the network. Through the phasing of new construction and strategic retrofitting or renovation of existing assets, the Modified Network addresses immediate needs at other locations while ultimately transforming the Boone Campus into a clean energy base housing solely zero-emission buses. One or two additional clean energy bases supplement the Boone Campus providing a network of campuses that facilitate the transition to a zero-emissions fleet by 2045 and allow Spokane Transit to thrive as it expands in a sustainable and adaptable way. This master plan outlines the steps necessary to make this a reality.

# 1.2 GUIDING PRINCIPLES

## SUPPORT THE MISSION

- Facilities support team members with the tools they need to thrive in their roles
- Infrastructure that celebrates the training and development of an adaptable, high performing team
- Facilities that attract and retain the best and brightest talent in the region

## EFFECTIVENESS

- Provide solutions that prioritize effectiveness, which drives efficiency
- Intuitive flow within and across facilities for safe, effective and efficient service delivery

## ADAPTABILITY

- Ability to adapt to ever-changing conditions and needs
- Ability to flex for expanding/contracting employee numbers
- Facilities can accommodate transitioning fuel sources and evolving technologies

## ORGANIZATIONAL SYNERGY

- Spaces to increase opportunities for intra-organizational collaboration and innovation
- Provide spaces that celebrate STA culture: past, present and future
- Size employee amenity spaces to encourage well-being and socialization

## STEWARDSHIP

- Thoughtful and careful use of public funding sources
- Leverage existing assets where feasible
- Encourage development that is most beneficial to our communities
- Provide opportunities for successful public interface to maintain trust and positive public perception
- Sustainable design choices

# 1.3 GOALS

The goals of this Plan build upon the vision, mission and goals set forth in both the 2015 Administrative and Maintenance Facilities Master Plan, as well as the Board approved Zero-Emission Transition Plan and Spokane Transit's long-term growth plan, Connect 2035. In particular, the planning found within this document aims to align, support and enhance the strategic plan laid out in Connect 2035 so that the two documents complement one another with Connect 2035 being the "what" and this Plan being the "how." For example, two of the core investments in Connect 2035 is a clean energy campus and a 100% zero-emission bus fleet. This Plan outlines the steps over the next five, ten and fifteen years of Spokane Transit's transition from diesel dependent to clean energy campuses and a zero-emission bus fleet.

All three goals found within Connect 2035 are supported by this Plan. While the goals are not independent – one cannot happen without the other two – the one most aligned with the outcomes of the master plan is Goal 3: Strengthen our capacity to anticipate and respond to the demands of the region. The strategies for achieving this goal will be realized through the actions outlined in the master plan:

**WHAT**: 3.1 Develop, prepare and empower our team members

**HOW**: This Plan provides a guide to inform Spokane Transit's future growth providing dedicated training facilities, adequate office space with built-in future flexibility, and amenity spaces focused on employee well-being. Space planning is built upon growth projections out to the year 2050 with the goal of creating organizational synergy and adaptability that will ultimately develop, prepare and empower Spokane Transit team members.

**WHAT**: 3.2 Engage in proactive assessment and planning, and deliver strategic long-term investments most beneficial to our communities

**HOW**: This Plan explores the highest and best use of long-term investments and how those investments are not only beneficial to Spokane Transit, but to the communities in which they reside and serve. In-depth site analysis is conducted and presented in this document on all potential properties being considered for long-term investments to ensure that negative impacts are minimized and positive impacts to the surrounding community are heightened.

**WHAT**: 3.3 Exemplify financial stewardship to maintain public trust and organizational sustainability

**HOW**: This Plan strategizes ways to leverage existing assets where feasible so that public funding sources are used in the most thoughtful and careful way possible. Public interface with Spokane Transit facilities is always carefully analyzed so that development has a positive public perception and community trust is maintained. Sustainable design choices explored in this Plan are made in support of the mission to reduce greenhouse gas emissions and the carbon impact of Spokane Transit's campuses.

## Previous Master Plan Goals

### ABILITY TO SUPPORT STA'S STRATEGIC LONG-TERM GROWTH PLAN (CONNECT SPOKANE)

*Key Question: How well do facilities alternatives support STA's ability to achieve strategic growth in a phased manner, while maximizing the value and return on past facilities investments?*

### EFFICIENCY OF FACILITY AND ADMINISTRATIVE OPERATIONS

*Key Question: What are the impacts of facilities alternatives on the efficiency of STA's day-to-day administrative operations and facilities management cost structure?*

### EFFICIENCY OF SERVICE DELIVERY

*Key Question: What are the impacts of facilities alternatives on STA's service delivery, including fixed route, Paratransit revenue service and supporting non-revenue operations such as maintenance and dispatch?*

### COMPATIBILITY WITH NEIGHBORHOOD AND COMMUNITY VALUES

*Key Question: What are the impacts of facility alternatives on STA's neighbors and community values?*

### EMERGENCY OPERATIONS CAPABILITY

*Key Question: How does STA provide service after a fire or natural disaster seriously damages the Boone facility and disables vital capability?*

## Connect 2035 Vision, Mission and Goals

### *VISION*

*Connecting everyone to opportunity*

### *MISSION*

*We provide safe, inclusive, convenient, and efficient public transportation service to Spokane area communities. We are leaders in transportation and a valued partner in the region's social fabric, economic infrastructure, and quality of life.*

| GOAL 1 | GOAL 2 | GOAL 3 |
|---|---|---|
| **ELEVATE THE CUSTOMER EXPERIENCE** | **LEAD AND COLLABORATE WITH COMMUNITY PARTNERS TO ENHANCE THE QUALITY OF LIFE IN OUR REGION** | **STRENGTHEN OUR CAPACITY TO ANTICIPATE AND RESPOND TO THE DEMANDS OF THE REGION** |
| 1.1 Expand and adapt mobility options to attract and serve more people | 2.1 Collaborate to enhance access to transit | 3.1 Develop, prepare, and empower our team members |
| 1.2 Advance frequent, easy-to-use, fast, and reliable service | 2.2 Support community partners to amplify community benefits | 3.2 Engage in proactive assessment and planning, and deliver strategic long-term investments most beneficial to our communities |
| 1.3 Deliver an outstanding door-to-door experience | 2.3 Proactively initiate partnerships to promote and help employers, service providers, and residential development to locate near high-frequency transit | 3.3 Exemplify financial stewardship to maintain public trust and organizational sustainability |
| 1.4 Create a welcoming, comfortable, and secure environment for all customers | | |

# 1.4 REFERENCED DOCUMENTS

In addition to the 2015 Administrative and Maintenance Facilities Master Plan and Connect 2035, this Plan references other relevant planning documents and studies to ensure a unified long-term vision for the future of Spokane Transit. Many of these documents have already laid the foundation upon which this Plan builds. Initiatives such as the Zero-Emission Transition Plan, the electrification of the Monroe-Regal Line and the completion of the City Line represent an initial phase paving the way for this Plan's implementation.

The 2015 Administrative and Maintenance Facilities Master Plan provided guidance for the now completed Boone NW Garage as an initial "NW expansion" to the Boone Campus. New parking was also added to the north side of the Boone Campus as part of this expansion. Phase 2 of that plan called for expansion onto what is referred to as the "Upriver Campus", which is the Spokane Transit Authority and WSDOT-owned property located at 3200-3300 E Mission Avenue. Phase 2 included a central city line expansion, a consolidated paratransit facility, and parking on this property with room for expansion once the SCC Transit Center was completed. The Transit Center is now complete; however, no expansion has taken place on the Upriver Campus to date.

This Plan refers to the Upriver Campus as the "Mission & Greene" property and also identifies it as an integral part of Spokane Transit's future growth. Because it is an existing asset, is relatively large and contiguous, and is centrally located at the east end of the City Line with excellent access to the North Spokane Corridor, the Mission & Greene site is a prime candidate to be developed into an asset for Spokane Transit. This Plan explores the possibility of a clean energy campus or a training facility on the Mission & Greene site to complement a network of campuses. Because the acquisition and development of the west half of the site is dependent upon WSDOT's completion of the North Spokane Corridor, this site cannot reach its full development potential until after that time; it is anticipated to be able to start site development on the west half sometime after 2032. Because of this, Mission & Greene has been evaluated for a use small enough that can initially be constructed on the east half of the site and then eventually expanded west, or for a larger use, such as an entire clean energy campus, that can be constructed after the completion of the North Spokane Corridor.

## Relevant Spokane Transit Documents

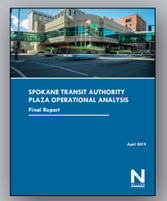
2010 rev. 2022


CONNECT SPOKANE

2015


ADMINISTRATIVE & MAINTENANCE FACILITIES MASTER PLAN

2019




PLAZA OPERATIONAL ANALYSIS

2021


DIVISION CONNECTS PHASE 1

2022


DIVISION CONNECTS PHASE 2

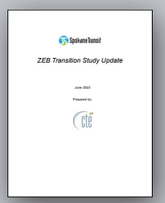
2023


TRANSIT DEVELOPMENT PLAN: 2024-2029

2022-2024


CONNECT 2035 TECHNICAL REPORT, STRATEGIC FOUNDATION AND PLAN

2023




ZEB TRANSITION STUDY

2023


DIVISION STREET BRT PHASE 1

2025

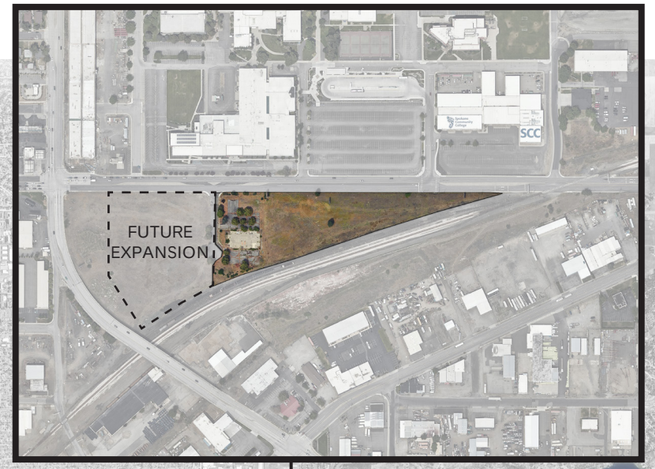

TRANSIT ASSET MANAGEMENT PLAN


# 2.0 INVENTORY

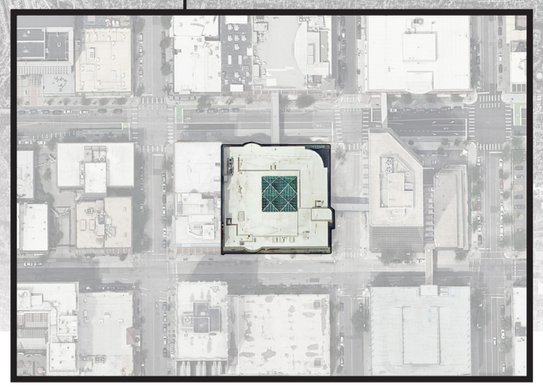
# 2.1 STA OWNED PROPERTIES

BOONE CAMPUS 15.12 acres

MISSION AND GREENE 5.95 acres




VALLEY SERVICE CENTER (FLECK) 3.29 acres

THE PLAZA

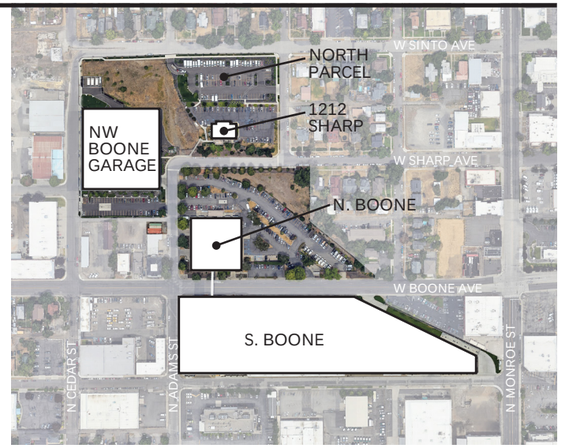
FAIRGROUNDS 11.26 acres

## 2.1.1 HIGH LEVEL EVALUATION OF CURRENT STA PROPERTIES

Spokane Transit Authority has existing assets in the form of owned property and facilities throughout the region. These properties are evaluated at a high level here and then more in depth in the site analysis section later in this document. Each property has been explored for its highest and best value contributing to the long-term growth plan.

### BOONE CAMPUS

**Total Parcel Area:** 15.12 acres
The Boone Campus has been home to STA for decades. It is a large, centrally located site that has served as the primary campus for STA consolidating most of the bus storage, paratransit operations, and administrative departmental staff. The campus is comprised of four independent buildings and surface parking, with North Boone and South Boone being connected via skywalk over W Boone Ave. There is potential for expansion through the acquisition of the neighboring parcels on the 1300 block of W Boone Ave.




#### South Boone

**Parcel Area:** 5.37 acres

**Current Use:** Diesel Bus Storage and Maintenance, Training, and various administrative departments

**Zoning:** GC-70

#### North Boone

Parcel Area: 3.85 acres

**Current Use:** Paratransit Storage and Maintenance, Executive Wing, and various administrative departments

**Zoning:** LI

#### NW Boone Garage

**Parcel Area:** 3.38 acres

**Current Use:** Electric Bus Storage and Charging

**Zoning:** LI

#### 1212 Sharp

**Parcel Area:** 1.03 acres

**Current Use:** Paratransit and Rideshare Operations

**Zoning:** OR-35

#### North Parcel

**Parcel Area:** 1.29 acres

**Current Use:** Parking

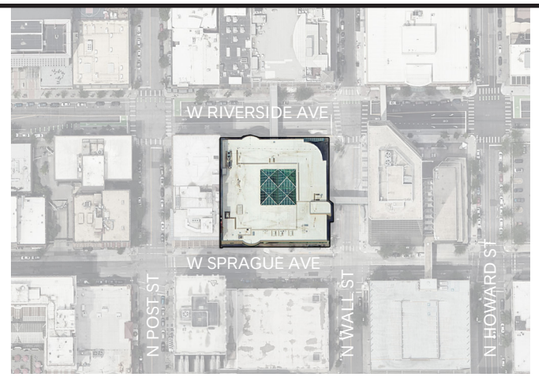
**Zoning:** OR-35





### PLAZA

**Parcel Area:** 0.81 acres
**Current Use:** The STA Plaza is a two-story structure with underground parking located in the heart of downtown Spokane. It is the region's busiest transportation center providing a hub for passengers to transfer between routes, access information, and wait comfortably for their connection. STA's Customer Service and Security staff are located at the Plaza providing public-facing interaction as well as private offices and training. Community Development, Planning & Grants, Capital Development, Records and a portion of Communications offices are also located on the second floor of the Plaza.




**Zoning:** DTC

### MISSION AND GREENE

**Parcel Area:** 5.95 acres (11.5 acres with available WSDOT property)
**Current Use:** The property at Mission and Greene is currently vacant. It is bounded by E Mission Ave. on the north and Union Pacific railroad tracks on the south. Currently, N Thor Ct. bounds the STA-owned property on the west and separates it from the WSDOT-owned property west of N Thor Ct. STA has first right of refusal on the WSDOT-owned property and, if acquired, the property could become a contiguous 11.5 acre parcel with the vacation of N Thor Ct. The North Spokane Corridor, currently under construction, occupies the westernmost portion of the site. The 11.5 acres does not include space allocated to the North Spokane Corridor and associated future easement. Contamination exists across the site in fill soils, at depths of approximately 1' to 7' below the surficial topsoil layer. Mitigation will be required during development of the site.

**Zoning:** LI

## VALLEY SERVICE CENTER (FLECK)

**Parcel Area:** 3.29 acres
**Current Use:** There is a service center building on the site used for fleet storage, maintenance and bus washing. There is a lunchroom and restrooms for drivers along with mechanics' desks and storage in the center bay of the building with additional storage on the mezzanine level above. Surface parking is provided in two separate lots with approximately 56 total spaces, along with a fenced-in exterior storage area that is used for Facilities and Grounds laydown and for vehicles awaiting auction. Rideshare and Paratransit vehicles are currently stored in the parking and storage areas. The opportunity for expansion exists to the east with 4 parcels totaling 4.69 acres potentially available for purchase.

**Zoning:** CMU (Spokane Valley Zoning Usages)


## FAIRGROUNDS

**Parcel Area:** 11.26 acres
**Current Use:** The Fairgrounds site is almost completely developed with aging pavement that is used as an STA drivers' training course and occasional overflow parking for the Spokane County Fairgrounds. The site does not abut any major streets, and access is through adjacent parcels – Fairgrounds to the north and west, and Railroad property to the east. Union Pacific railroad tracks border the southern edge of the site. There are no existing structures on the site.

**Zoning:** RC (Spokane Valley Zoning Usages)



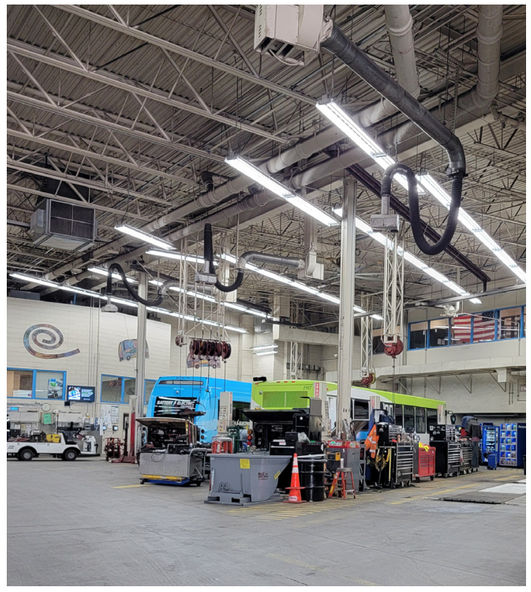

## 2.1.2 BEST USE EVALUATION OF CURRENT PROPERTIES

High level evaluations of each of STA's currently owned properties were conducted to determine what uses or program functions should be studied at each site. For example, certain sites, because of their size, access and location, make them better candidates for a new clean energy base than others. The best use of the facility based on this evaluation is listed at the bottom of this table, however, multiple options were studied for each of these sites.

YES SOMEWHAT NO

| | BOONE CAMPUS | PLAZA | MISSION AND GREENE | FLECK | FAIRGOUNDS |
|---|---|---|---|---|---|
| *Over 10 acres?* | 🟢 | 🔴 | 🟡 | 🔴 | 🟢 |
| *Located on Bus Line(s)?* | 🟢 | 🟢 | 🟢 | 🟡 | 🟡 |
| *Ability to Expand?* | 🟡 | 🔴 | 🟢 | 🟡 | 🔴 |
| *Centrally Located?* | 🟢 | 🟢 | 🟢 | 🟡 | 🟡 |
| *Easily Accessed?* | 🟢 | 🟢 | 🟢 | 🟡 | 🔴 |
| *Zoning Conducive to Bus Storage & Maintenance?* | 🟢 | 🔴 | 🟢 | 🟢 | 🟢 |
| *Available Infrastructure?* | 🟢 | 🟢 | 🟢 | 🟢 | 🟡 |
| *Space for Training Course?* | 🔴 | 🔴 | 🟢 | 🟡 | 🟢 |
| *Supports the Mission?* | 🟢 | 🟢 | 🟢 | 🟢 | 🟡 |
| *Adaptable?* | 🟡 | 🟡 | 🟢 | 🟢 | 🔴 |
| *Stewardship of Funds?* | 🟢 | 🟢 | 🟢 | 🟢 | 🟡 |
| *Value to STA?* | 🟢 | 🟢 | 🟢 | 🟢 | 🟡 |
| **BEST USE OF FACILITY** | Supplement and alleviate overcrowding with new facilities, renovate to clean energy base as diesel phases out | Administrative functions, public-facing STA departments | New clean energy base or training facility | Remain as a flexible and adaptable site for STA's interim & long-term needs | Once a new training facility is completed, site has value to STA for bartering or trade value |

# 2.2 STA OWNED FACILITIES



## 2.2.1 HIGH LEVEL EVALUATION OF CURRENT STA FACILITIES

STA has utilized and maintained their existing facilities for decades, taking great care to adapt these spaces as needs evolve, and make fiscally strategic investments to improve the facilities over time.

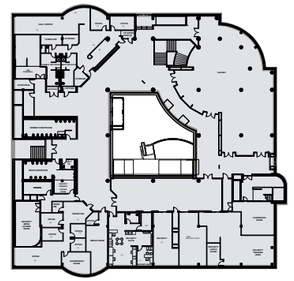
Nevertheless, spaces are tightly occupied, inefficient and leave virtually no room for accommodating further growth in employees or in vehicle storage or maintenance capacity.

The following pages provide a brief overview of the physical condition of each of STA's facilities, considering building envelope, interior finishes, HVAC, plumbing and electrical systems, as well as upcoming Clean Building Performance Standards. Each facility is provided a condition score, which was derived from the evaluation forms found in Appendix II.

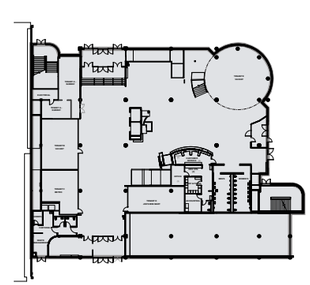
Further, section 3.1 documents how each STA department occupies and utilizes spaces within each building, describing workflows and identifying unmet functional needs.

*1212 Sharp Level 2*

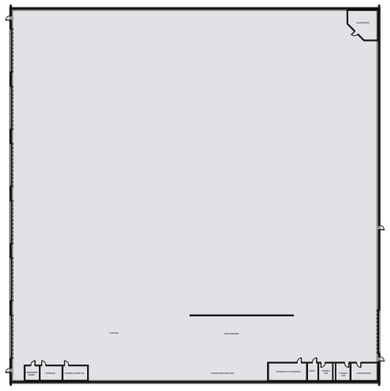
*1212 Sharp Level 1*



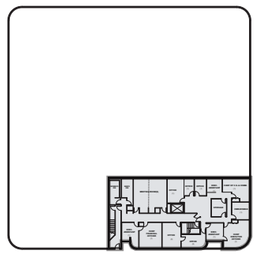
*Plaza Level 2*



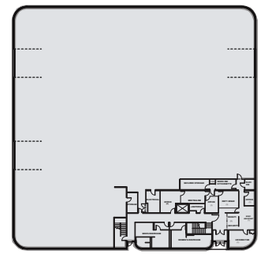
*Plaza Level 1*



*NW Boone Garage Level 1*

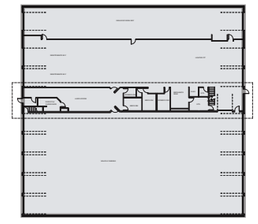


*North Boone Level 2*

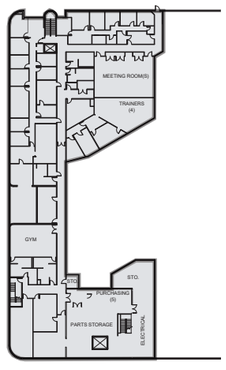


*North Boone Level 1*

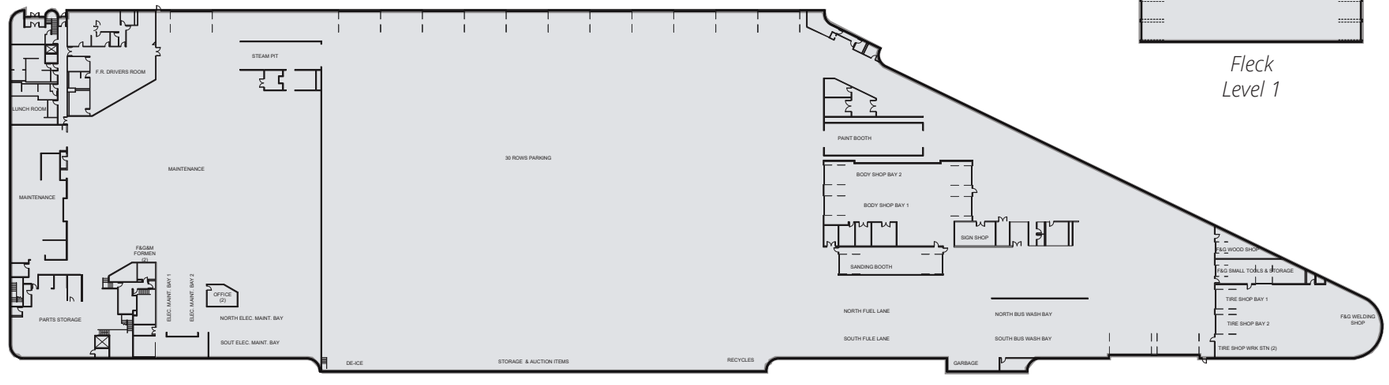
*Fleck Level 2*



*Fleck Level 1*




*South Boone Garage Level 2*




*South Boone Garage Level 1*

## 2.2 STA OWNED FACILITIES
## BOONE SOUTH

At 220,184 square feet, Boone South (1229 W. Boone Ave.) is STA's largest facility and is primarily used as storage and maintenance for the bulk of the fixed route buses, in addition to housing the bulk of Administrative offices and the space where Training and STA Board Meetings occur.

Built in 1985, the facility has undergone several small renovations to accommodate evolving needs. The exterior envelope and interior finishes are in good, but aged condition. Mechanical systems are original, but have continued to receive upgrades since 2015. There are 2 bus washers, a sanding booth, paint booth, body shops, tire shop, sign shop, welding shop, diesel fueling, and storage for all vehicle components.

There are limitations on coach types accommodated at Boone South: clearance only allows for double decker buses in limited areas of the facility, fueling available is diesel only, and modern technologies and space needed for supporting the zero emissions transition are not available.

Nearly all functions within this facility are lacking sufficient space. Buses are currently being parked with very minimal space in between and out of service vehicles awaiting disposal are required to be parked elsewhere, occasionally at customer-facing transit facilities.


### Upcoming Projects:

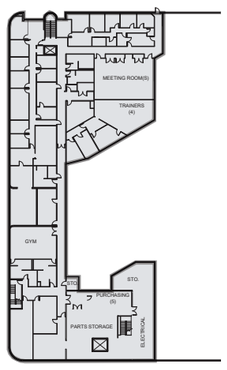
- Adding HVLS fans at the east end of the facility
- Replacement of main distribution panels
- Elimination of motor control panels
- Replacement of generators with natural gas
- Upgrade east utility transformer to support BEB charging
- Add either 5 or 10 cabinets (10 or 20 dispensers, respectively) for BEB charging

The facility score is: 50

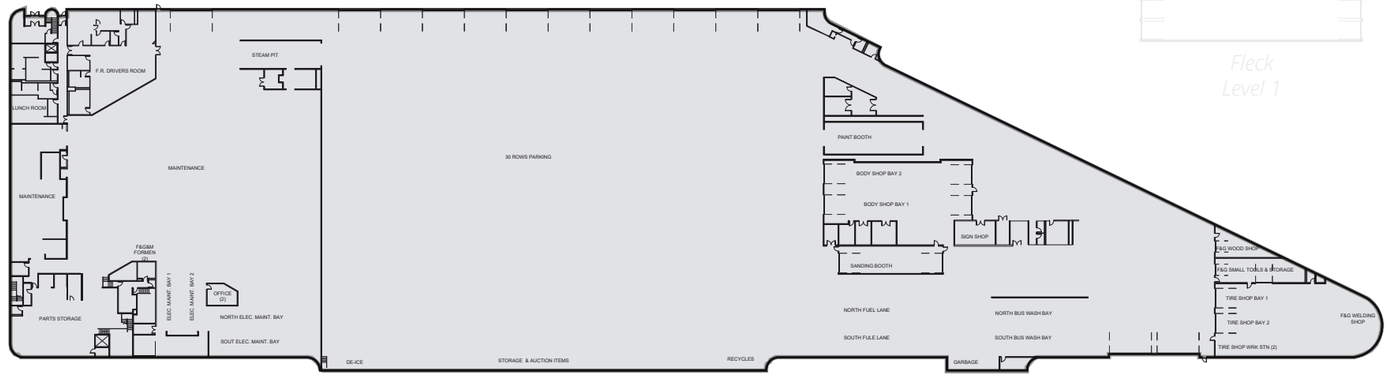
### Recent Upgrades:

2018-19: Paint Booth & Controls Replacement
2020: Energy savings project (tire shop and sanding booth systems & controls upgrade), railed fall protection for BEB Maintenance in two bays, lighted pit rehab, non-diesel UST replacements.
2021: Elevator modernization; Install in-ground lighted pit repair; Install railed fall protection for BEB maintenance; body shop door upgrade to 15' CLR; install single mode fiber optic cable
2023: Renovation at sunroom; tire shop door upgrade to 15' CLR; replaced shipping / receiving doors; install single mode fiber optic cable
2024: Finished Diesel UST replacement; HVLS fans installed over maintenance area
2025: Second floor tenant improvements




*South Boone Garage*
*Level 2*




*South Boone Garage*
*Level 1*

## 2.2 STA OWNED FACILITIES
## BOONE NORTH

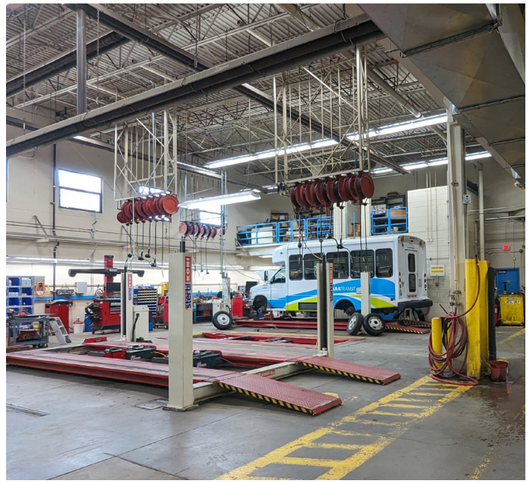
Connected to Boone South via a skybridge over Boone Ave, the North Boone building (1230 W. Boone Ave.) is 32,580 square feet. This facility was built in the same era - 1985 - as Boone South and is home to Paratransit storage and maintenance, which remain powered by internal combustion engines and do not require storage or charging of batteries.

The facility has undergone several small renovations to accommodate evolving needs. The exterior envelope and interior finishes are in good, but aged condition. Mechanical systems are original, but have continued to receive upgrades since 2020. There is one small vehicle washer, 4 maintenance bays, gasoline fueling and storage for vehicle components.

Clearances for height and turning movement in the garage are limited to small revenue service vehicles and non-revenue vehicles, which are serviced here but are housed elsewhere.

The remainder of the facility houses a public reception area, administrative office spaces including the CEO's suite and a conference room where STA Committee Meetings are held.

Nearly all functions within this facility are lacking sufficient space. Vans are currently being parked with very minimal space in between.



### Recent Upgrades:

2018: Renovation of Public Reception and HR Suite
2020: Energy savings project (first and second floor MAU replacement and controls upgrade), non-diesel UST replacements
2023: Elevator modernization; install single mode fiber optic cable
2025: Second floor tenant improvements

### Upcoming Projects:

- Addition of HVLS fans at east end of facility
- Replacement of main distribution panel
- Elimination of motor control panel

The facility score is: 60

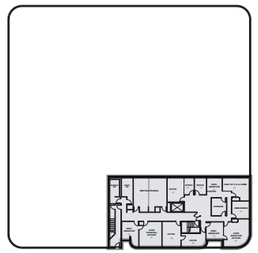

1212 Sharp
Level 2

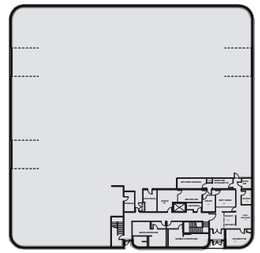

1212 Sharp
Level 1


Plaza
Level 2


Plaza
Level 1


NW Boone Garage
Level 1


North Boone
Level 2


North Boone
Level 1


Fleck
Level 2


Fleck
Level 1


South Boone Garage
Level 2


South Boone Garage
Level 1

## 2.2 STA OWNED FACILITIES
## BOONE NORTHWEST GARAGE

The 68,640 square foot Northwest Garage (1224 N. Cedar St.) was built in 2019 for efficient means of storage for STA fixed route coaches. Including a bus washer, diesel fueling station, electric charging stations, it has capacity to store a varied number of vehicles, depending on vehicle size. It stores STA's entire fleet of battery electric buses (BEB) - a total of 40 currently - and houses the 7 new double decker coaches.

Quality of exterior envelope, interior finishes and mechanical, electrical and plumbing systems are generally excellent. All overhead clearances associated with this building are a minimum of 15', which makes it the only garage that fully accommodates double-decker coaches.

Though this facility was not originally planned to accommodate coach maintenance, needs are such that maintenance is currently being done in the garage space, staged out of the storage room and utilizing portable ladders. There is a workstation in the corner of the garage for use by bus manufacturer representatives, who will work from there for sometimes up to six months while training and introducing coaches into the fleet.

**Recent Upgrades:**

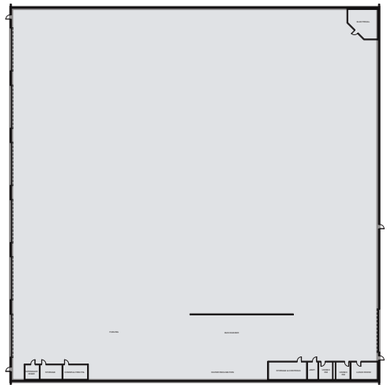
2021: EV charging added with power upgrades
- 5 - 150 kW cabinets; 10 dispensers
- 6 cabinets, 2 - 450 kW pantographs
- 2 - 800 kW generators
- Upsized utility transformers to bring 3 MW of power to the facility

2024: EV charging added
- 5 cabinets; 10 dispensers

**Upcoming Projects:**
- Adding HVLS fans

The facility score is: 91





*NW Boone Garage*
*Level 1*



*1212 Sharp*
*Level 2*



*1212 Sharp*
*Level 1*



*Plaza*
*Level 2*



*Plaza*
*Level 1*



*North Boone*
*Level 2*



*North Boone*
*Level 1*



*Fleck*
*Level 2*



*Fleck*
*Level 1*



*South Boone Garage*
*Level 2*



*South Boone Garage*
*Level 1*

## 2.2 STA OWNED FACILITIES
## 1212 SHARP

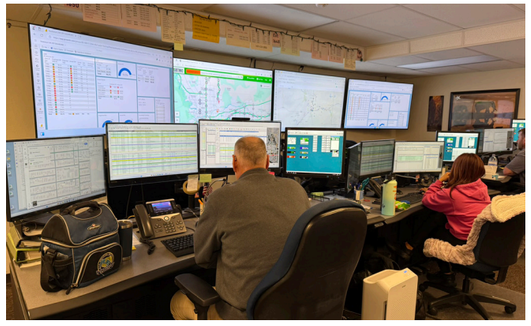
The 6,384 square foot building at 1212 W. Sharp Ave is an adimistrative facility, housing Paratransit Administration and Operations.

Office and meeting spaces are provided for Paratransit and Rideshare administrative employees and Paratransit operations such as the call center, dispatch, and driver area.

Only the upper level was able to be made ADA accessible.  There are portions of the lower level that experience flooding during times of heavy stormwater.  A sump pump has been installed in the adjacent drywell that struggles to handle significant loads.

Mechanical systems are inefficient and have recently been supplemented with additional mini-split units to adequately condition rooms with heavy equipment loads.

This aging, residential-grade building poses both functional, as well as upkeep challenges.  It is expected that this facility will not undergo any further significant renovation, as it has reached the end of its usable life.



**Recent Upgrades:**

2014:  Significant remodel
2018:  Generator installed
2019:  Stair addition for access from parking lot to basement floor
2022:  Addition of ductless split units
2024:  Demolition of aging wood deck

The facility score is: 34

1212 Sharp
Level 2

1212 Sharp
Level 1



Plaza
Level 2



Plaza
Level 1



NW Boone Garage
Level 1



North Boone
Level 2



North Boone
Level 1



Fleck
Level 2



Fleck
Level 1



South Boone Garage
Level 2



South Boone Garage
Level 1

## 2.2 STA OWNED FACILITIES
## FLECK (VALLEY SERVICE CENTER)

The 21,300 square foot Fleck Valley Service Center (123 S. Bowdish Rd.) was built in 1991. Its garage stores the fixed route coaches (13) and paratransit vans (10) that serve routes in Spokane Valley.

In addition to indoor coach and cutaway parking, there are 3 maintenance bays which are used to provide maintenance on paratransit vans and fixed route coaches when needed, a bus washer, diesel fueling, break room and parking for employees. There is not yet any EV charging infrastructure at this facility.

With the exception of a full-time shift of servicing crew members, employees occupying this building are temporary in nature - whether they are drivers coming and going from their shift, a maintenance worker who comes from Boone to work on a vehicle, Facilities and Grounds crew on a break, or an administrative employee utilizing the hotel workstation, none are assigned to work full-time in this facility.

Nearly all functions within this facility are lacking sufficient space. Buses and vans are currently being parked with very minimal space in between.

Recent Upgrades:
2016: Roofing replaced & insulation upgraded
2017: Fencing added
2020: Energy savings project consisting of
- Lighting replaced with LED fixtures
- Makeup Air Unit replaced
- Garage doors replaced
- Generator replaced
- Building controls added
- CO2 and NOx sensors installed

2022 - 25: Underground fuel tanks and fueling island replaced, new bus washer installed.

The facility score is: 61



1212 Sharp
Level 2



1212 Sharp
Level 1



Plaza
Level 2



Plaza
Level 1



NW Boone Garage
Level 1

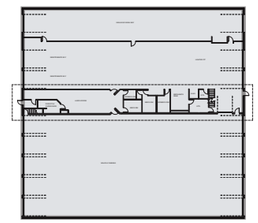


North Boone
Level 2



North Boone
Level 1

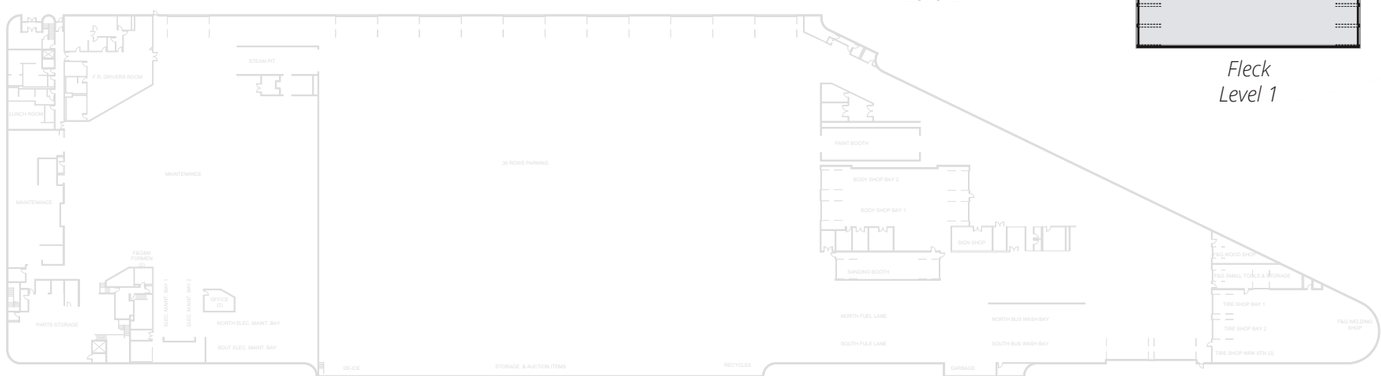
Fleck
Level 2



Fleck
Level 1



South Boone Garage
Level 2



South Boone Garage
Level 1

## 2.2 STA OWNED FACILITIES
## DOWNTOWN PLAZA

The 90,432 square foot facility in Downtown Spokane (701 W. Riverside Ave.) serves as STA's central transit hub for both Fixed Route and Paratransit riders, as well as administrative space for Customer Service and Security, along with some other STA administrative offices.

There are five tenant spaces on the ground level, three of which are occupied, and some administrative space and break rooms for STA employees on the second level - a portion of which is not currently utilized. Security and Customer Service departments are headquartered at the plaza, with a customer service counter and customer waiting areas. The basement houses a small number of vehicle parking stalls for STA and tenant use.

The facility underwent significant renovation in 2016-2017. Exterior and interior finishes remain in relatively good condition. MEP systems have undergone upgrades, but the major HVAC units remain aged and inefficient.

Recent Interior Upgrades:

2019: Overlay at skywalk roofs; remodel 2nd floor bathrooms, Energy Savings Project (building controls upgrade)
2020: Replaced garage doors
2022: Replaced one cooling tower and one boiler
2023: Upgraded security camera system
2024: Upgraded first floor restrooms; replaced automatic access doors

The facility score is: 85

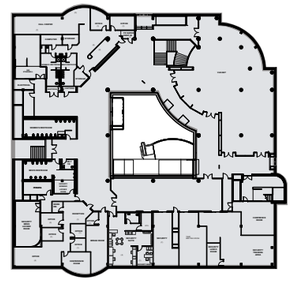




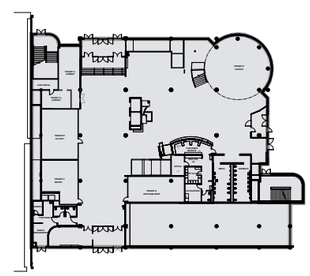
1212 Sharp
Level 2



1212 Sharp
Level 1



Plaza
Level 2



Plaza
Level 1



NW Boone Garage
Level 1



North Boone
Level 2



North Boone
Level 1



Fleck
Level 2



Fleck
Level 1



South Boone Garage
Level 2



South Boone Garage
Level 1

# 2.3 CLEAN BUILDING PERFORMANCE STANDARDS

Washington State's recently enacted Clean Building Performance Standard (CBPS) will be rolling into effect over the next decade. The CBPS establish a target Energy Use Intensity (EUI) for existing commercial buildings. The CBPS will require compliance, first, in 2026 to buildings over 220,000 sf, and then in 2027 to buildings over 90,000 sf, and in 2028 to buildings over 50,000 sf. Ultimately, requirements will be put into place for Tier 2 buildings, which includes commercial buildings over 20,000 sf.

STA has begun to prepare for compliance with the CBPS, which involves establishing an energy use benchmark for an existing building, determining the prescriptive required Target EUI, comparing current energy use against the target and finally, developing and implementing an Energy Management Plan (EMP) and Operations and Maintenance Program (OMP).

Identifying a deficiency between the benchmarked EUI of an existing building against its Target EUI, will realize areas where improvements should be made to a facility to bring it into compliance. The following summarizes steps that have been taken to-date on existing STA buildings facing compliance in the coming years.

> BOONE CAMPUS: Overall, it appears the campus will comply with CBPS for the short-term without any immediate concerns. Monitoring and metering systems have been implemented to maximize strategic compliance and ease the oversight and management of compliance, as well as ensure preparation for any required upgrades. Small scale TI improvements should be minimized or avoided to the extent possible in these buildings until a comprehensive renovation can be done, upgrading mechanical systems. Any work on this campus should be strategized and phased with this in mind.

BOONE NORTH: This building is on the edge of compliance and can likely become compliant with some small adjustments to the heating and cooling schedule. Any significant remodel will want to include upgrades to existing mechanical systems. The timeframe for this building to demonstrate compliance has yet to be determined, but will not be prior to 2028.

BOONE SOUTH: This building is currently meeting the CBPS with flying colors, likely due to a recent installation of High Velocity Low Speed fans in the garage area. An EMP and OMP have been created for this building. Any significant remodel will want to include upgrades to existing mechanical systems. This building will be required to demonstrate compliance in June of 2026.

BOONE NORTHWEST: This building has been measuring right at its target EUI. With the recent addition of secondary meters and the subsequent reallocation of a portion of the EV charging load, the building is expected to meet metered compliance easily once the milestone arrives.

> DOWNTOWN PLAZA: This building is falling short of meeting the target EUI by a substantial amount. Small projects are underway to bring down the EUI, but will likely not make a large enough difference. An estimated $16 million project to replace mechanical systems is estimated to bring the building into compliance, but at a 110 year payback, is not a realistic option to consider at this point. Investment Path compliance or accepting the fines may likely be the most cost-effective path to compliance for the short term. This building will be required to demonstrate compliance by June of 2028.

> FLECK SERVICE CENTER: Fleck is far out of compliance with CBPS, but is under 20,000 sf, so will not need to comply for an undetermined period of time, likely not prior to 2030. Monitoring of the building's energy performance is nevertheless being done, utilizing the same employee training, notices and EMP / OMP strategies for best practice.

Evaluation and modification to systems at all facilities continues to occur. Actions such as dialing in temperature set-points, separating functions with variable set-points, metering to better monitor health of equipment and uncovering opportunities to deduct loads are standard practice at all existing

*The timeline to the right reflects Clean Building Performance Standards milestones.*

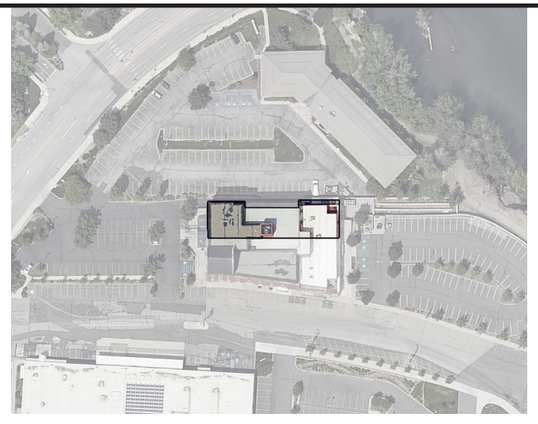


# 2.4 STA LEASED FACILITIES

High level evaluations of each of STA's currently leased facilities were conducted to determine what functions currently satisfied with leased space need to be accommodated in new facilities. The goal of this Plan is to consolidate functions onto STA campuses and provide permanent homes with future flexibility so that leasing space is no longer necessary.

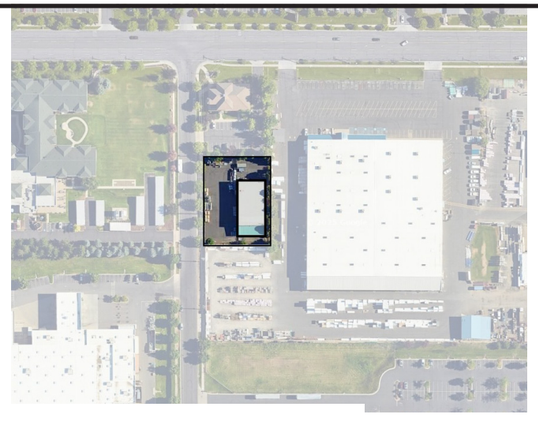
## SCHADE TOWER

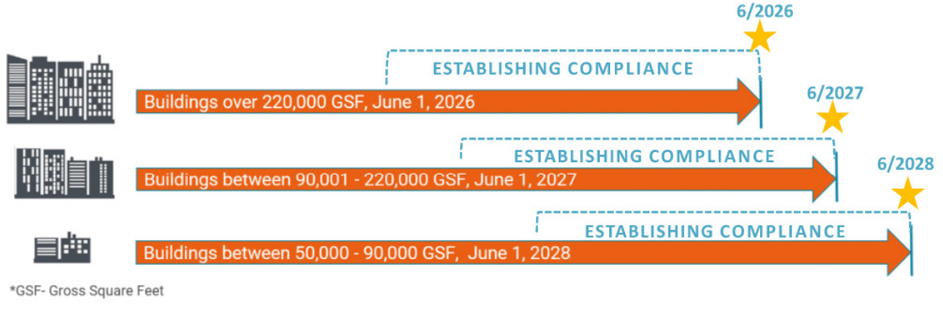
**Leased Area:** Approximately 4,500 sf
**Current Use:** Schade Tower is a historic building located at 528 E Spokane Falls Boulevard in Spokane's University District. STA leases space on the ground floor of the building that is used partially by Planning and Development, and the Web Services portion of Information Services.
**Zoning:** DTU



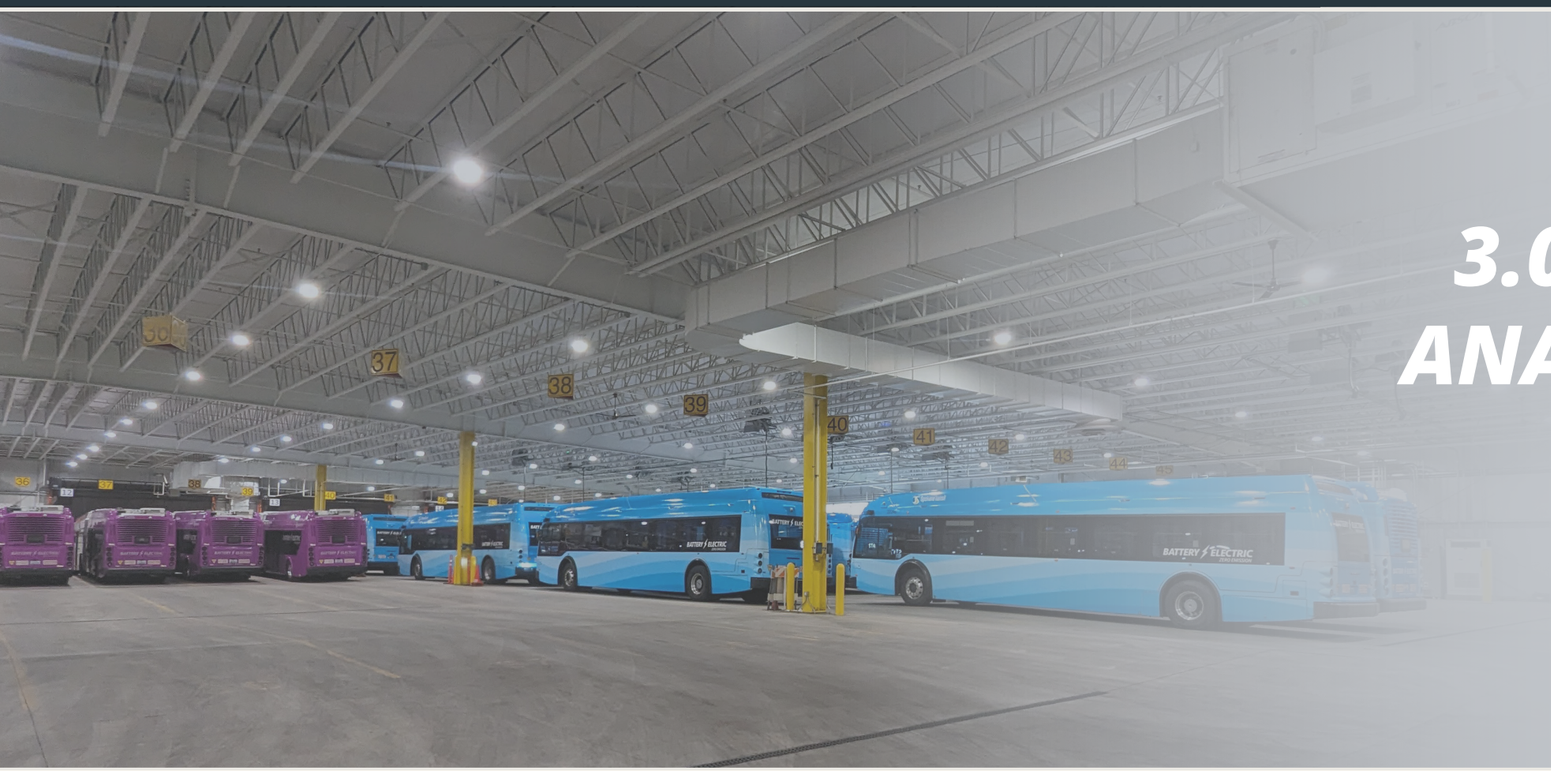
## 608 E HOLLAND AVE

**Leased Area:** Approximately 4,900 sf
**Current Use:** 608 E Holland Ave. is a leased warehouse and partially covered outdoor storage area in North Spokane used by STA's Facilities and Grounds department to store bus stop amenities and equipment. There is a small workshop with tools and a shared break room in the facility.
**Zoning:** GC-70






*GSF- Gross Square Feet



# 3.0 CURRENT OPERATIONS ANALYSIS (PROGRAMMING)

# 3.1 CURRENT SPATIAL ANALYSIS & NEEDS ASSESSMENT
## ALL DEPARTMENTS

Spokane Transit Authority is an organization of nearly 800 employees across several departments. Many employees work in the field throughout the service area, operating fixed route or paratransit coaches, patrolling and ensuring safety of operations, and maintaining vehicles, grounds and facilities. Many others work administratively in support of STA operations.

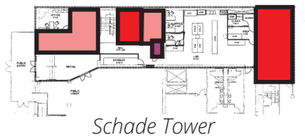
While STA has taken great care to maintain, maximize and prolong the use of their legacy facilities, many of the functions have outgrown current available spaces. Largely, the organization's workflows, innovation and modern workplace needs are not effectively supported by the outdated buildings and infrastructure.

The following sections describe how the various departments within STA work and utilize available space, as well as outline their specific needs, both within the department, as well as interdepartmentally.

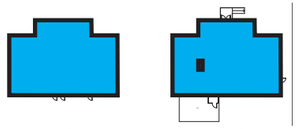
As is apparent in the color-coded plans on this page, the departments within STA are fragmented and spread across eight separate facilities including owned and leased space. This creates inefficiencies and a lack of collaboration with departments feeling siloed from each other. Departments have grown into one another and are competing for space with multiple rooms serving dual purposes, oftentimes beyond the original intended purpose of the space. It is also apparent that there is a lack of shared spaces, including amenity areas for employees, beyond just restrooms and small break and meeting rooms.

**LEGEND:**

- Human Resources
- Communications and Customer Service
- Finance
- Planning and Development
- Service Delivery: Fixed Route
- Service Delivery: Paratransit and Rideshare
- Maintenance
- Facilities and Grounds
- Chief Executive Officer and Board of Directors

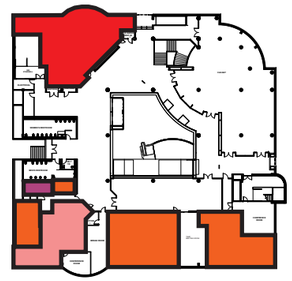


*Schade Tower*

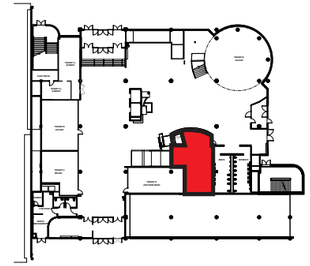


*1212 Sharp Level 2*

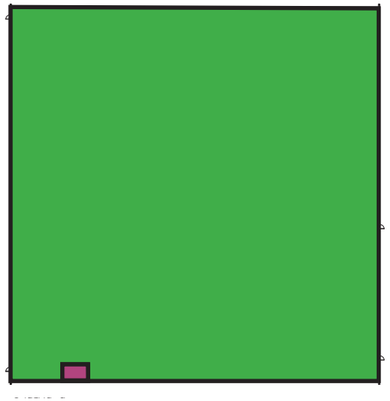
*1212 Sharp Level 1*



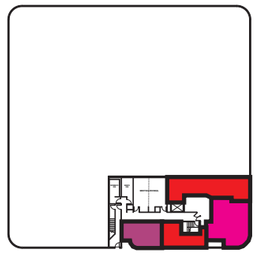
*Plaza Level 2*



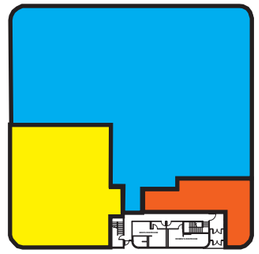
*Plaza Level 1*



*NW Boone Garage Level 1*

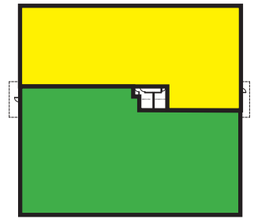


*North Boone Level 2*

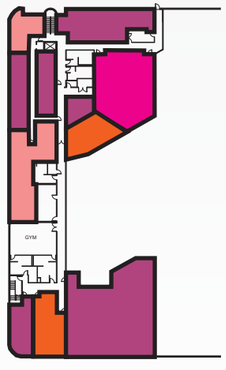


*North Boone Level 1*

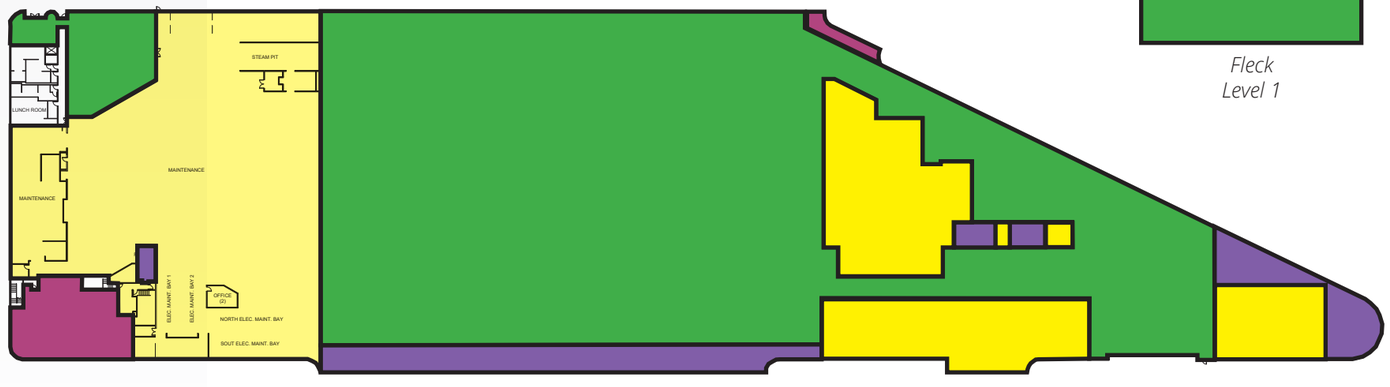
*Fleck Level 2*



*Fleck Level 1*




*South Boone Garage Level 2*




*South Boone Garage Level 1*

# 3.1 CURRENT SPATIAL ANALYSIS & NEEDS ASSESSMENT

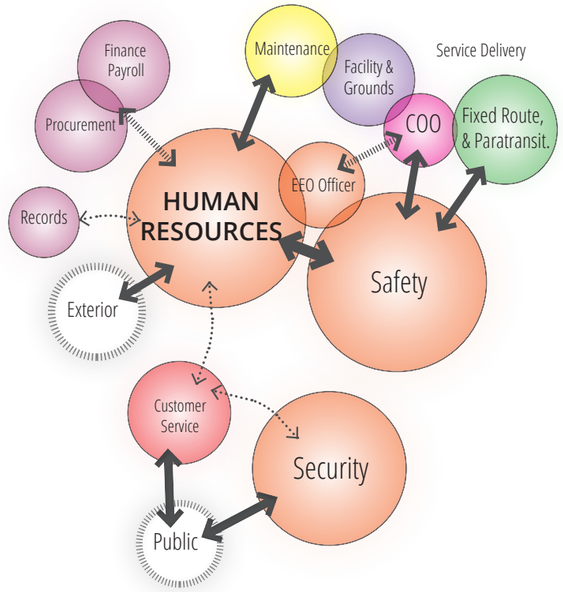
## HUMAN RESOURCES

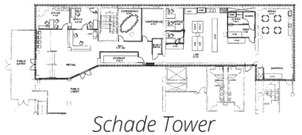
The Human Resources (HR) department's responsibilities encompass Safety, Security, Training and HR. Ensuring regulatory requirements are met for safety standards across the organization, and required training is provided for all employees, including specialized training for coach operators, vehicle maintenance and tactical training for Security, falls under HR's purview. Dedicated general and specialized training classrooms for groups of around 15 are a consistent and significant need.

In addition to frequent HR meetings with individual employees, many specialized meetings occur in this department. From meetings with regulatory agency representatives, Union negotiations and mediation sessions, including separate breakouts for grievances and bargaining processes, to internal investigations with interviews and records review processes, the needs for dedicated, varied-sized and acoustically sensitive meeting spaces for HR use are significant.

Security Officers disperse from and return to a hub location with a meeting huddle space, lockers, showers and changing area. Their shifts are spent in the field throughout the greater service area. It is foreseeable that a security dispatch center will need to be added in the near future. There is a contracted team of security personnel that occasionally meets onsite with the internal team.

- Anticipated Growth: In 2020, the HR department consisted of 25 employees and by 2024 is comprised of 36 employees, reflecting 44% growth. While it is expected that the Security team will continue to grow at this significant rate, little growth is expected among HR or Safety positions.
- Immediate Needs: More readily available meeting spaces; Sufficient lactation spaces throughout, dedicated training rooms, more acoustically private office spaces.
- Long Term Vision: Spaces and amenities to support employee wellness.

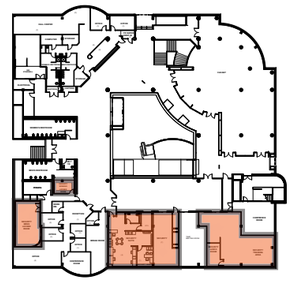


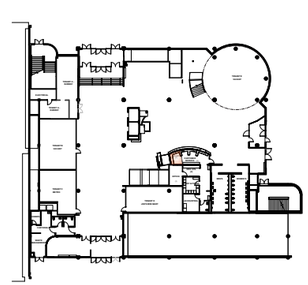
*Schade Tower*

*1212 Sharp*
*Level 2*

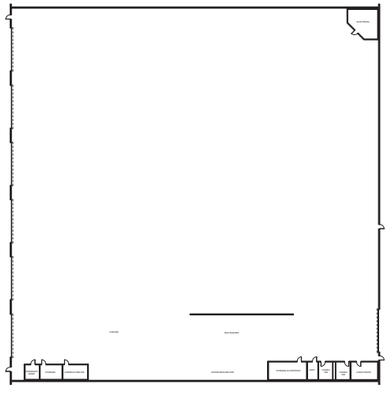
*1212 Sharp*
*Level 1*



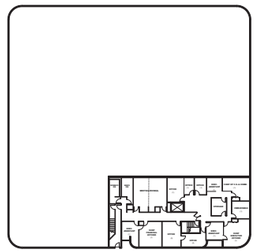
*Plaza*
*Level 2*



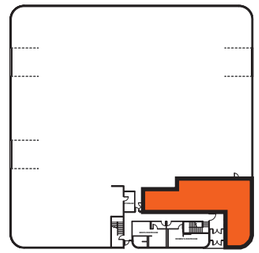
*Plaza*
*Level 1*



*NW Boone Garage*
*Level 1*

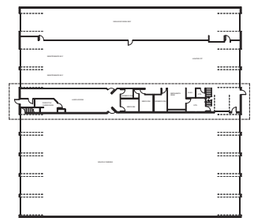


*North Boone*
*Level 2*

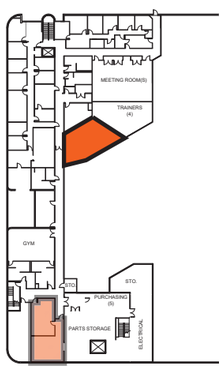


*North Boone*
*Level 1*

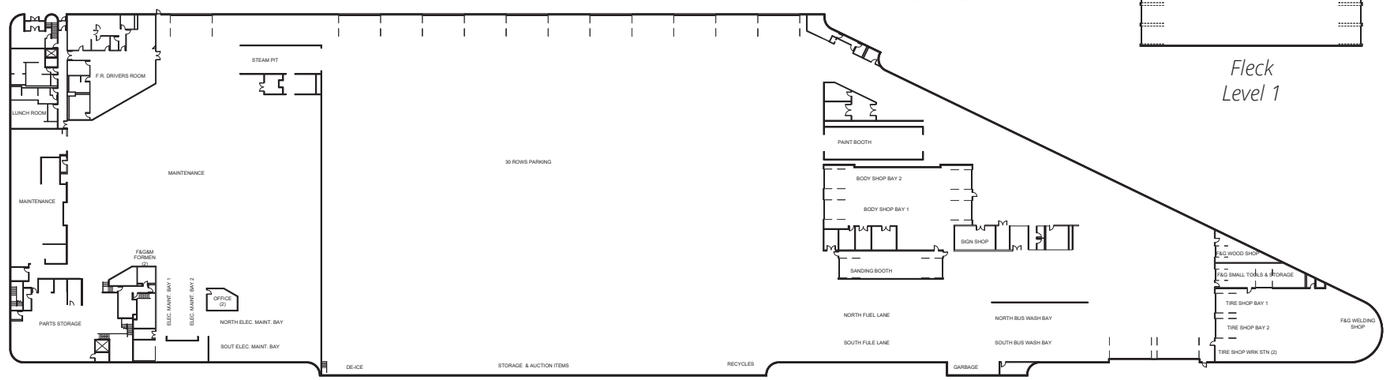
*Fleck*
*Level 2*



*Fleck*
*Level 1*




*South Boone Garage*
*Level 2*




*South Boone Garage*
*Level 1*

# 3.1 CURRENT SPATIAL ANALYSIS & NEEDS ASSESSMENT
## COMMUNICATIONS & CUSTOMER SERVICE

The Communications and Customer Service department's responsibilities include Business Development, Communications and Marketing, Customer Service and Web Services. This team is heavily engaged with other departments and with the public: from local businesses and organizations to riders to media consumers.

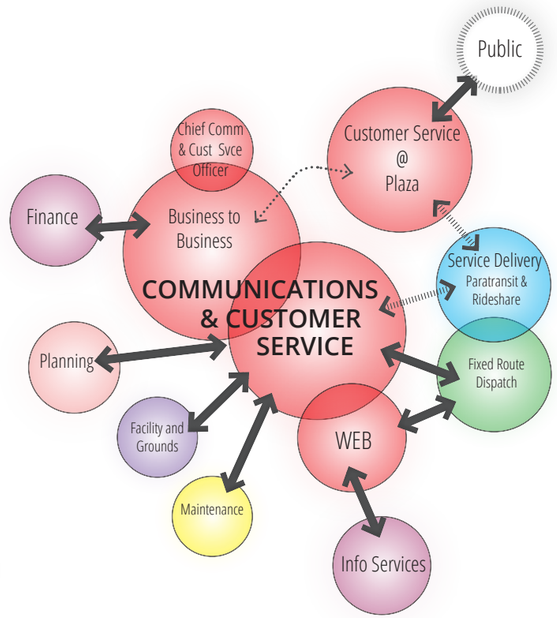
The Business Development team heads out into the community frequently to engage with local businesses and organizations for community outreach and promotion of ridership.

The Communications and Marketing team's award-winning work is lively, interactive and embedded throughout the organization as they continually photograph, film and share stories from employees throughout STA. As such, they enjoy a centrally located space with close proximity and easy access to all other departments. Their current space is too cramped to facilitate such collaborative projects and does not accommodate adding any new, much-needed team members.

Customer Service assists customers by administering bus passes, sharing information and answering questions at both a physical walk-up counter, as well as a call center. Both are currently located in the Downtown Plaza. They frequently coordinate with the security team, fixed route supervisors and dispatchers, as well as the marketing team.

The Web Services team develops and maintains STA's website, as well as digital data within customer facing mediums such as signage, apps and notifications. They work closely with Fixed Route supervisors to get the data to be pushed out digitally, as well as with Information Services. Physical work on large signage equipment is also done by this group.

- Anticipated Growth: In 2020 there were around 22 employees, and by 2024 is comprised of 26, which is a growth of around 14%. The rate of growth in this department is expected to remain relatively consistent with that 14% rate.
- Immediate Needs: More space for small group meetings, workspaces for additional team members, adequately-sized video studio and dedicated voiceover booth, additional storage space.
- Long Term Vision: A co-located Communications team with space to better coordinate and collaborate with each other, several small flex rooms to house small breakout meetings, visitor 'hotel' workstations or acoustically sensitive work. More transparency and ability to display and celebrate the work occurring within STA, a more public and dedicated space for the 'hallways of history'.

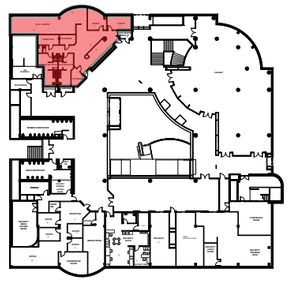


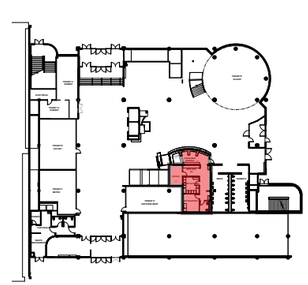


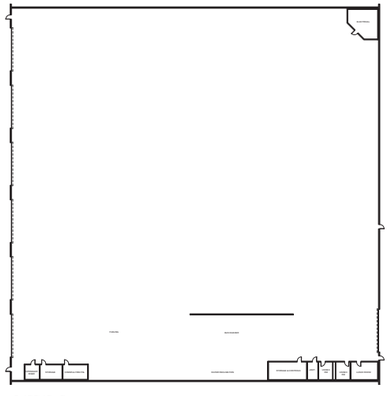
Schade Tower

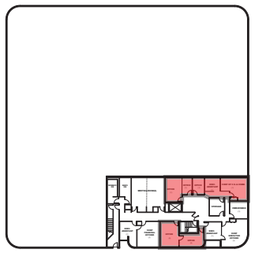

1212 Sharp Level 2

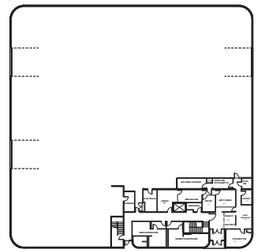

1212 Sharp Level 1


Plaza Level 2

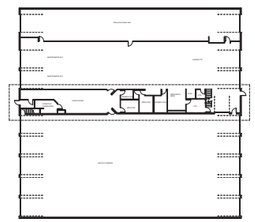

Plaza Level 1

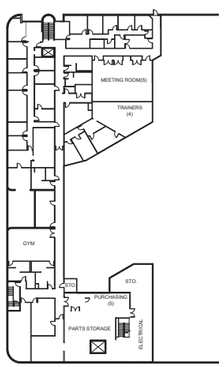

NW Boone Garage Level 1


North Boone Level 2

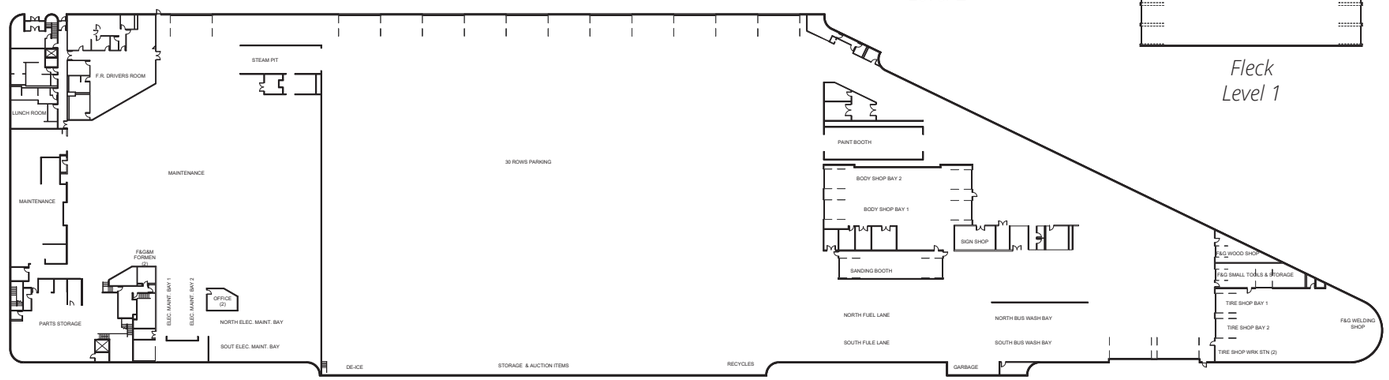

North Boone Level 1


Fleck Level 2


Fleck Level 1



South Boone Garage Level 2



South Boone Garage Level 1

# 3.1 CURRENT SPATIAL ANALYSIS & NEEDS ASSESSMENT

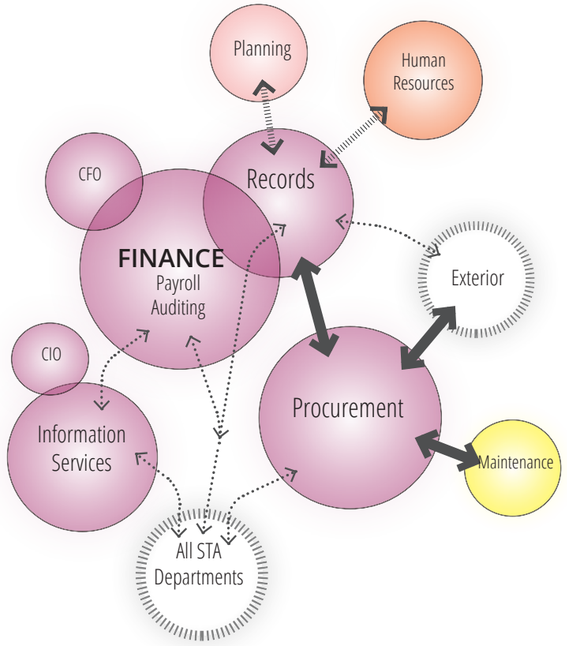
## FINANCE

The Finance department's responsibilities include Financial Services, Records, Information Services and Procurement. This team as a whole can be thought of as the biggest internal 'customer service' providers to employees within the organization, with high levels of collaboration with all other departments in STA. This department receives a lot of visitors – about 80% of visitors are employees from within STA and 20% are from outside – vendors, auditors or public records requests.

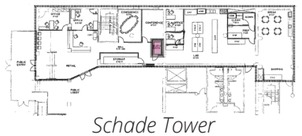
The Finance team, responsible for accounting and payroll, is accessed frequently by all employees. Additionally, it is subject to various outside auditing processes and frequently host outside guests who work temporarily onsite.

The Records team keeps physical and digital records organized and accessible for both internal needs, as well as for records requests by the public. While much of the storage for physical records is currently onsite, it is envisioned that a shift will move toward an off-site storage location.

Information Services supports the network, databases and servers for the entire organization, repairing and upgrading equipment and working with Web Services to ensure data and information are seamlessly relayed through their platforms. The Procurement team is responsible for all purchases, storage and distribution of parts and vehicles. This requires a sizable storage footprint that needs close proximity to maintenance areas as well as a loading dock that is removed from transit traffic.



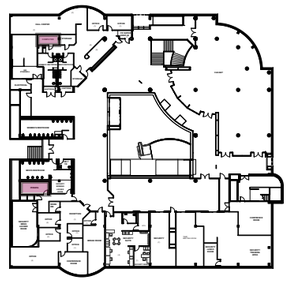

- Anticipated Growth: In 2020 there were around 28 employees and by 2024, is comprised of 36, which is a growth of around 28%. Continued growth is expected with recent investments in IS, as well as Procurement who heavily supports various projects.
- Immediate Needs: More space for small group meetings, upgrades to improve safety and accessibility for building occupants, and a dedicated space for public review of records.
- Long Term Vision: Modernized, collaborative workspaces that inspire employees to bring their best, with well-daylit, open and interactive space to encourage camaraderie and provide comfort, celebrating the wellbeing of employees.



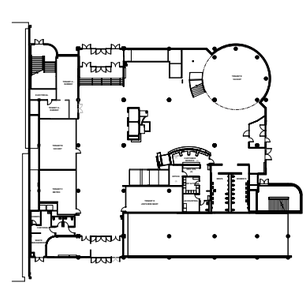
*Schade Tower*

*1212 Sharp Level 2*

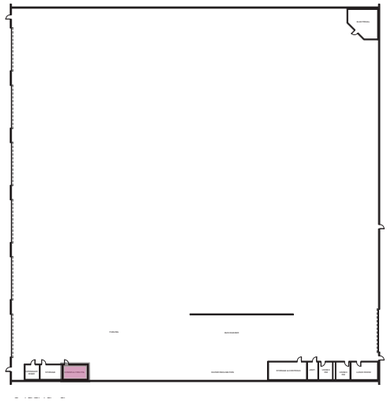
*1212 Sharp Level 1*



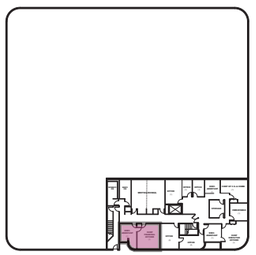
*Plaza Level 2*



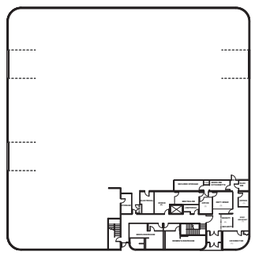
*Plaza Level 1*



*NW Boone Garage Level 1*

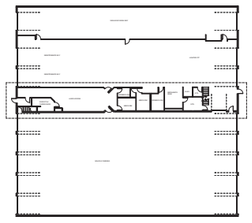


*North Boone Level 2*



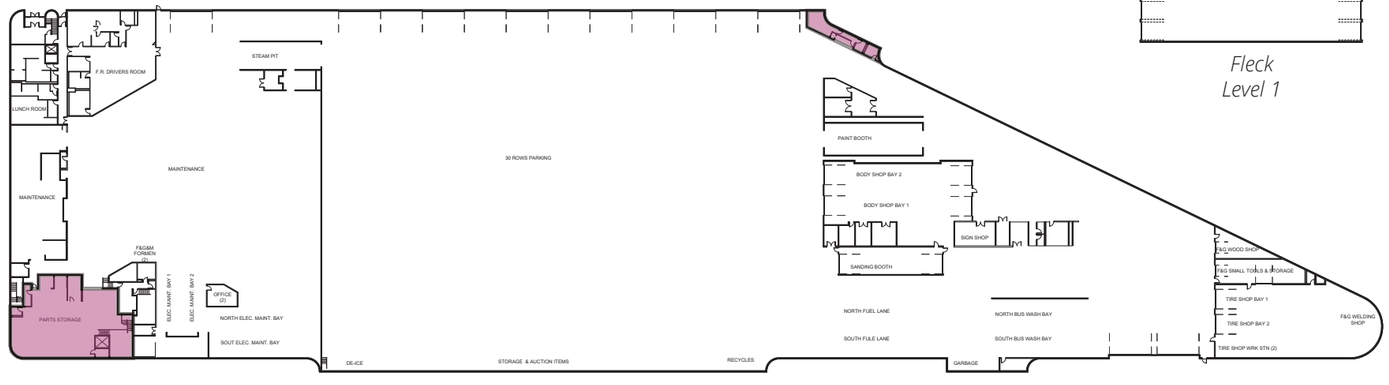
*North Boone Level 1*

*Fleck Level 2*



*Fleck Level 1*


*South Boone Garage Level 2*




*South Boone Garage Level 1*

## 3.1 CURRENT SPATIAL ANALYSIS & NEEDS ASSESSMENT

# PLANNING AND DEVELOPMENT

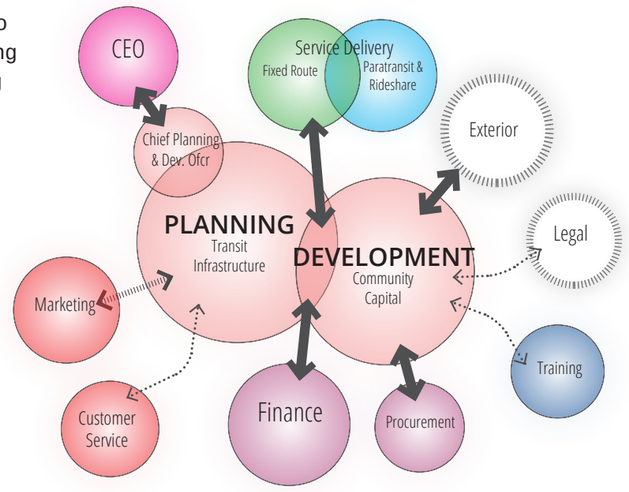
The Planning and Development department's responsibilities cover Capital, Infrastructure, Service and Community Development, as well as Planning and Grants.

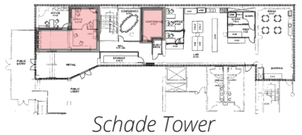
The Capital Development team is critical in Facilities Master Planning and capital project management, coordinating with all departments. They provide oversight to the Infrastructure Development team, who oversees projects from concept to occupancy, managing Architectural and Engineering consultants and working with Finance to establish and execute contracts.

The Service Development teams are responsible for planning and executing fixed route service in line with the strategic and comprehensive planning established by the Community Development team. Additionally, they are coordinating collaborative agreements with outside agencies, strategic real estate planning and acquisitions.

There is close collaboration with other departments such as Finance, Facilities and Grounds, and Safety. Planning and Development frequently hosts and participates in meetings of various sizes and types, and benefits from the ability to have spontaneous collaborative huddles. Current space constraints limit the ability for such meetings and contribute to inefficiencies in workflow and resources.

- Anticipated Growth: In 2020 there were 19 employees, and by 2024 is comprised of 29, which is a 52% increase over the last four years. Some growth will occur in the future, but likely not at this high rate.
- Immediate Needs: Increase shared space for idea generation and more efficient resource sharing, parking congestion alleviation, more break spaces with refrigerators and microwaves and lunch tables.
- Long Term Vision: A cohesive campus environment with opportunities for employees to come together and flexible spaces to accommodate organizational expansion and contraction.

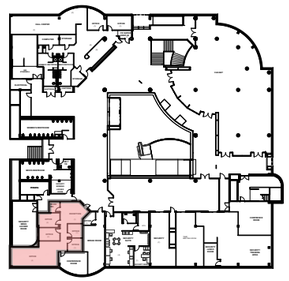


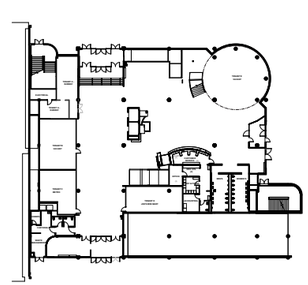
*Schade Tower*

*1212 Sharp Level 2*

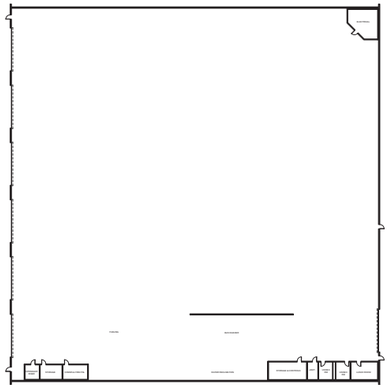
*1212 Sharp Level 1*



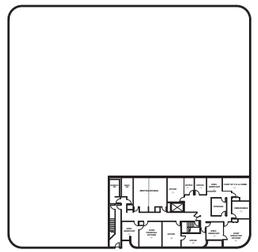
*Plaza Level 2*



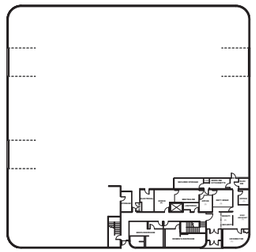
*Plaza Level 1*



*NW Boone Garage Level 1*

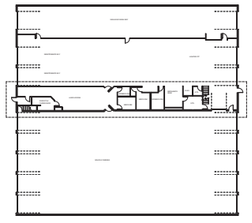


*North Boone Level 2*



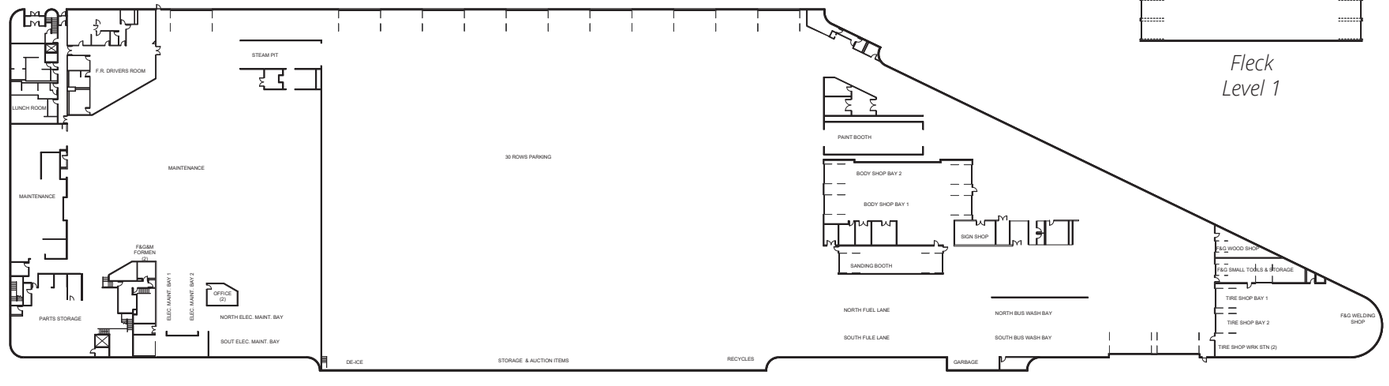
*North Boone Level 1*

*Fleck Level 2*



*Fleck Level 1*


*South Boone Garage Level 2*




*South Boone Garage Level 1*

# 3.1 CURRENT SPATIAL ANALYSIS & NEEDS ASSESSMENT

## SERVICE DELIVERY: FIXED ROUTE

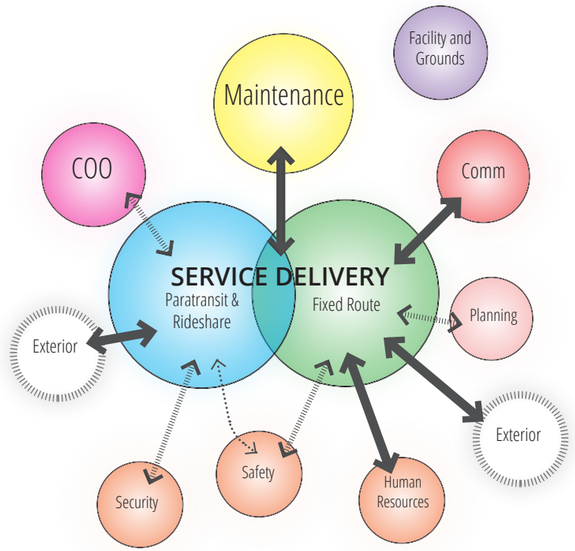
The Fixed Route Department is the largest within STA and is responsible for overseeing the delivery of the Fixed Route service. It includes coach operators, supervisors and dispatchers. This active and agile team operates for 22 hours per day, 365 days per year.

Each day, they orchestrate a morning pull-out that is a complex, fast-paced and time-sensitive endeavor that occurs within a tightly packed and maxed out space. This team prioritizes safety, efficiency and promptness while 136 buses pull out of the Boone South garage within a 3 hour window each morning – about 40 per wave.

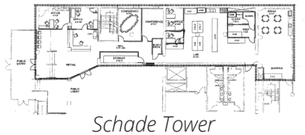
Supervisors, Dispatchers and Drivers all organize to plan and execute the process of unpacking the parked garage in an orderly manner. Coach operators base out of their Driver's room with lockers and space to hang out and wait, Dispatchers in a focused Dispatch center, and supervisors in offices near the garage. There is limited space for the frequent meetings throughout each day – these typically occur in someone's office.

Standby drivers are always available, waiting for assignments and responding to any needs. They spend shifts of up to 12 hours in the Drivers room, which consists of lockers and some tables and chairs. A dark room with a TV for more quiet relaxation and entertainment is also available.

The fixed route team works most closely with Maintenance, HR, Safety, and Information Services.



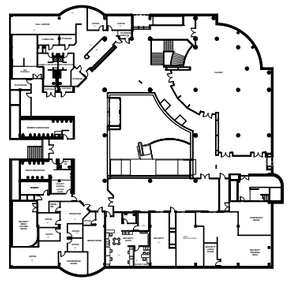

- Anticipated Growth: Between 2020 and 2024 Fixed Route service increased by 18% and is expected to grow its service another 3% by 2027. The number of employees, having a direct relationship to service growth, is expected to go from 315 to 386 by 2027. This is a sustainable growth rate for the department of approximately 10 employees per year with the majority of that growth made up of coach operators. STA is striving to have 1 supervisor for every 12-16 coach operators, and 1 manager for every 100-120 Fixed Route employees.
- Immediate Needs: Revisions to Drivers room for greater efficiency and better amenities to ensure wellness for standby Drivers spending long hours in that space. Increased space for Dispatch and Supervisor office area – need for more collaboration and interaction areas. Increased security/access control for the garage, offices, and dispatch.
- Long Term Vision: Collocated break areas to provide opportunities for Drivers and other employees and management to interact and connect. A central and collocated campus, with ample parking.



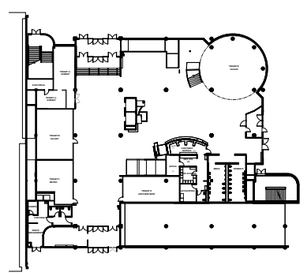
*Schade Tower*

*1212 Sharp Level 2*

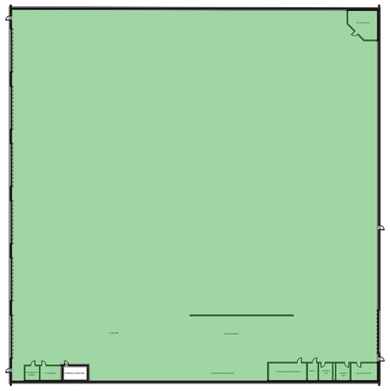
*1212 Sharp Level 1*



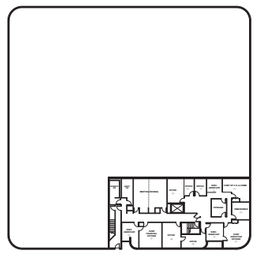
*Plaza Level 2*



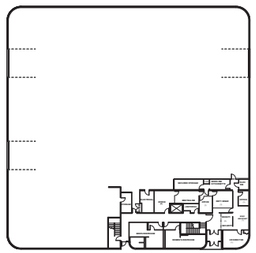
*Plaza Level 1*



*NW Boone Garage Level 1*

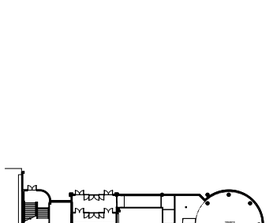


*North Boone Level 2*

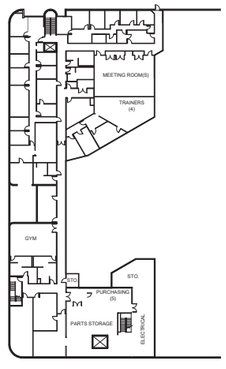


*North Boone Level 1*

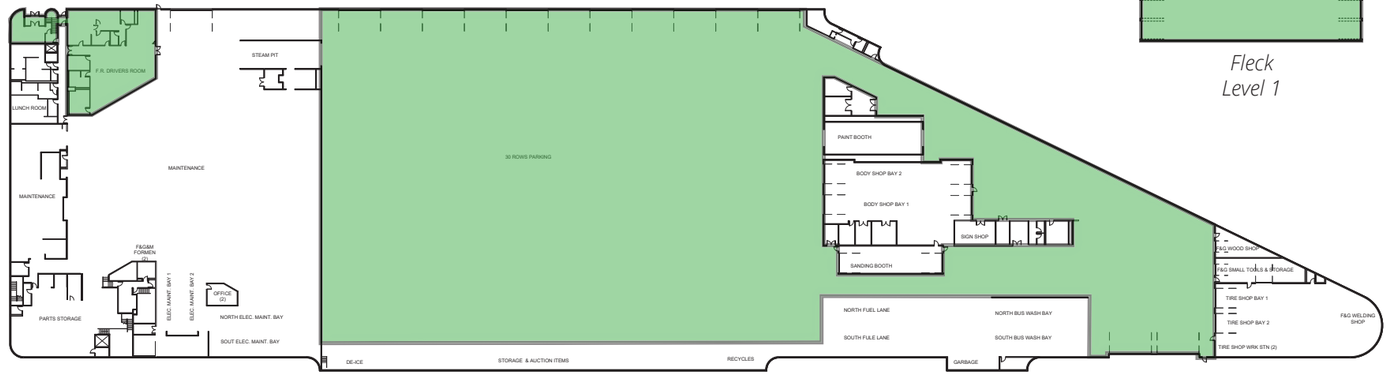
*Fleck Level 2*



*Fleck Level 1*




*South Boone Garage Level 2*




*South Boone Garage Level 1*

# 3.1 CURRENT SPATIAL ANALYSIS & NEEDS ASSESSMENT

## SERVICE DELIVERY: PARATRANSIT AND RIDESHARE

The Paratransit and Rideshare department is responsible for executing the operations of the Paratransit service and the Rideshare commuter program.

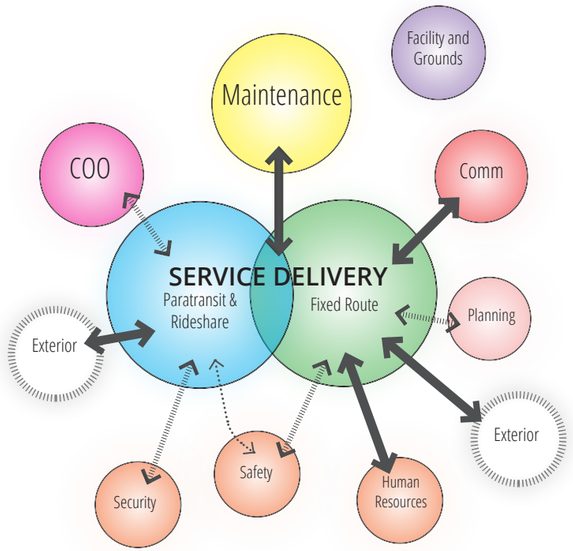
A call center houses dispatchers who organize 700 or more calls per day to facilitate reservations for a fleet of 74 paratransit vans to provide service to the community whose disabilities prevent them from utilizing the fixed route service. A privately contracted paratransit provider supplements STA's weekday service, operating through nights and weekends.

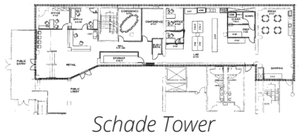
The Paratransit service delivery occurs similar to the Fixed Route, with dispatchers organizing drivers and monitoring van locations, but is a little more unpredictable with changes, cancellations and determining their most efficient routes daily.

The Rideshare service oversees a fleet of 97 vehicles for citizen use to transport commuter groups who live and commute to similar areas. These vehicles typically remain out in the community, and most of the coordinating is done with the public customers via phone, unless they are coming to drop off or pick up a vehicle for maintenance. Staging for rideshare vehicles in transition – to maintenance, to auction or to new customers – is a significant need that is not fully accommodated in the current location.

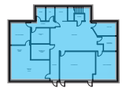
This department handles the majority of its needs (Scheduling, Safety, etc) internally, so does not interact much with other departments, with the exception of Human Resources, Maintenance, Procurement and the COO, to whom it would be beneficial to have closer proximity. Their current square footage feels sufficient to accommodate their needs, but its configuration is not ideal or efficient.

- Anticipated Growth: In 2020 there were 88 staff, and in 2024 there are 96 – a 9% increase over the past 4 years. Program growth had gone to a private contracting service until recently, so this department would expect to see moderate growth in the operations side of the department with minimal growth in administrative staff.
- Immediate Needs: Space that allows for increased efficiency in workflows, particularly drivers arriving to check in and transition to their vehicles.
- Long Term Vision: A singular location for Paratransit services – possibly including the contracted service provider, maintenance and enclosed garage storage, including provisions for charging zero emissions Paratransit and Rideshare vehicles. A covered vehicle trade area for Rideshare vans, with access to a car wash. Increased facility accessibility.

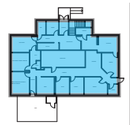


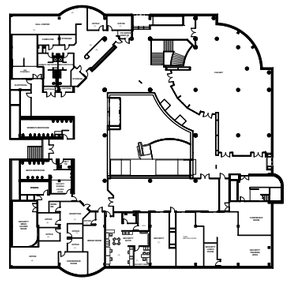
*Schade Tower*



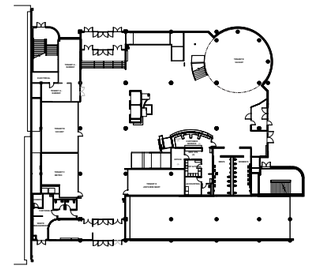
*1212 Sharp Level 2*



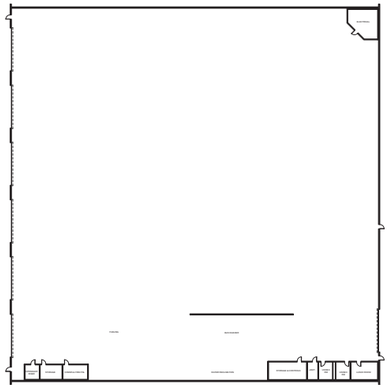
*1212 Sharp Level 1*



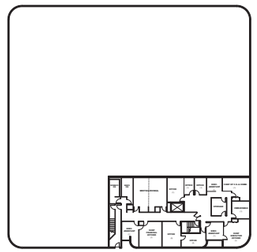
*Plaza Level 2*



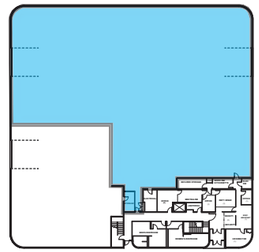
*Plaza Level 1*



*NW Boone Garage Level 1*

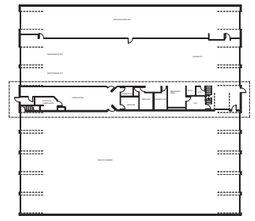


*North Boone Level 2*

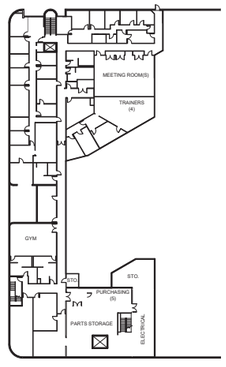


*North Boone Level 1*

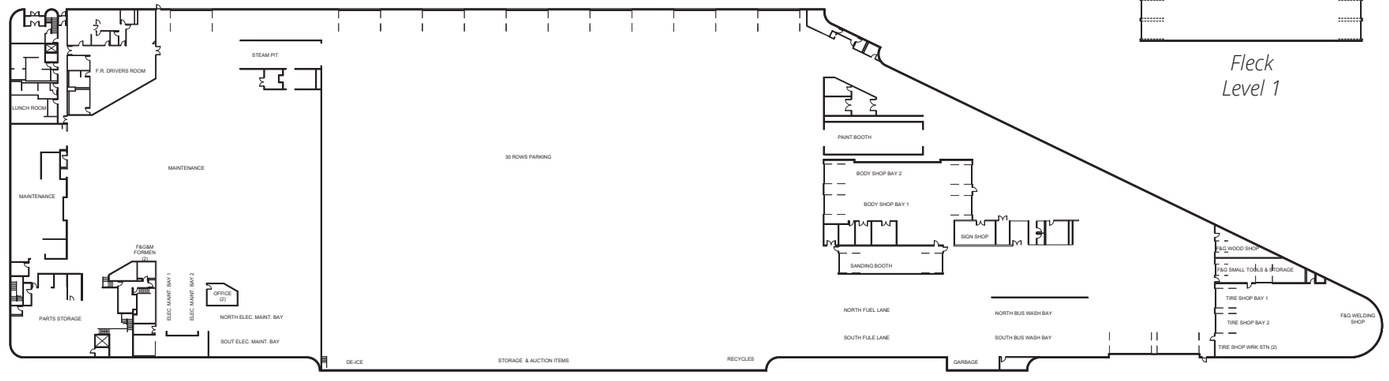
*Fleck Level 2*



*Fleck Level 1*




*South Boone Garage Level 2*




*South Boone Garage Level 1*

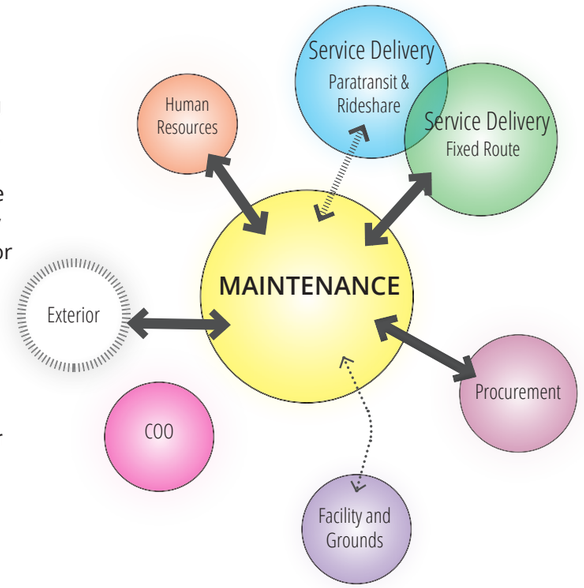
## 3.1 CURRENT SPATIAL ANALYSIS & NEEDS ASSESSMENT

# MAINTENANCE

The Maintenance department is responsible for Vehicle Maintenance for all 440 vehicles that belong to STA, as well as overseeing the Fleet Transition to Zero Emissions Buses (ZEB).

A team of 100 mechanics and service cleaners are continuously on shift, maintaining vehicles 24/7/365. Inventory management is a critical component for the Maintenance team, who must work in very close coordination with the Procurement team.

The maintenance garage is a high-traffic area with periods of heavy activity, for example during morning pull-out when drivers discover short repair needs during their test runs. There is currently not a dedicated space, or "command center", for the foremen and leads to monitor needs and coordinate maintenance efforts. The maintenance needs have outgrown the current space by more than double, and there are currently only 4 bays for EV maintenance, which is not enough.

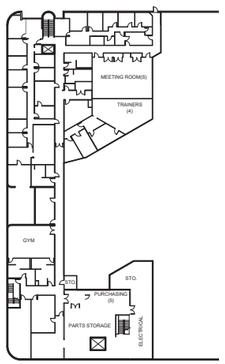



The primary components within the maintenance shop are: the engine department (for rebuilding engines), the transmission department, the electrical department (which has been vastly outgrown) and the body shop (which is busier than it's ever been). Dedicated space for training modules is needed, as these are currently kept in multiple different locations. The current needs for Paratransit maintenance require a space that is 2 to 3 times larger than the current space.

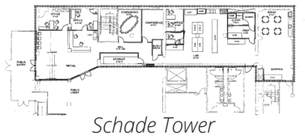
Maintenance needs for ZEBs are very different than for diesel buses, as the bulk of the work occurs at the roof of the bus instead of at the back bumper. Fall protection and lift needs at bays will continue to grow. The current fire safety precautions for Battery Electric Buses recommend they are parked 10' apart, instead of the 3' spacing that is currently used. There is a need for the ability to park all battery electric vehicles indoors in a controlled environment to ensure reliability in charge time and scheduling.

Current parking insufficiencies are a significant struggle – for both STA vehicles, as well as staff vehicle parking.

- Anticipated Growth: In 2020 there were 84 people in this department and in 2024 there are 106, which reflects a growth of 26% over the past four years. A lot more growth is anticipated in this department, as any increased space will require increased personnel. There would be some operational savings in a single campus scenario over two locations.
- Immediate Needs: Centralized, clean and climate-controlled inventory spaces, additional maintenance bays – about 14 more are currently needed.
- Long Term Vision: A singular campus with support amenities that aren't currently enjoyed – like a break room, an expanded fitness gym and a locker room with showers. A built-out training facility, which could be in a separate location. Consider configuring the garages to support a no back-up policy.



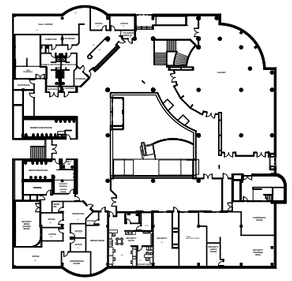

*South Boone Garage*
*Level 2*



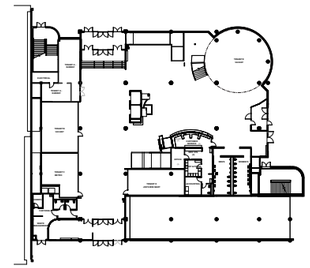
*Schade Tower*

*1212 Sharp*
*Level 2*

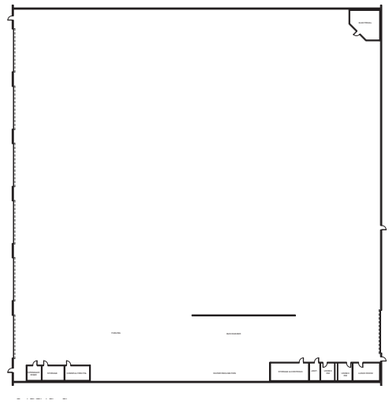
*1212 Sharp*
*Level 1*



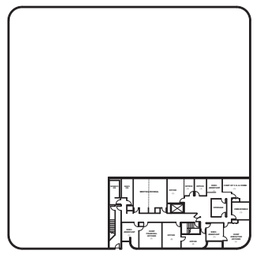
*Plaza*
*Level 2*



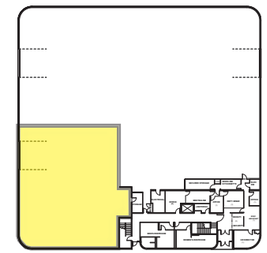
*Plaza*
*Level 1*



*NW Boone Garage*
*Level 1*

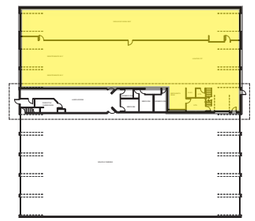


*North Boone*
*Level 2*

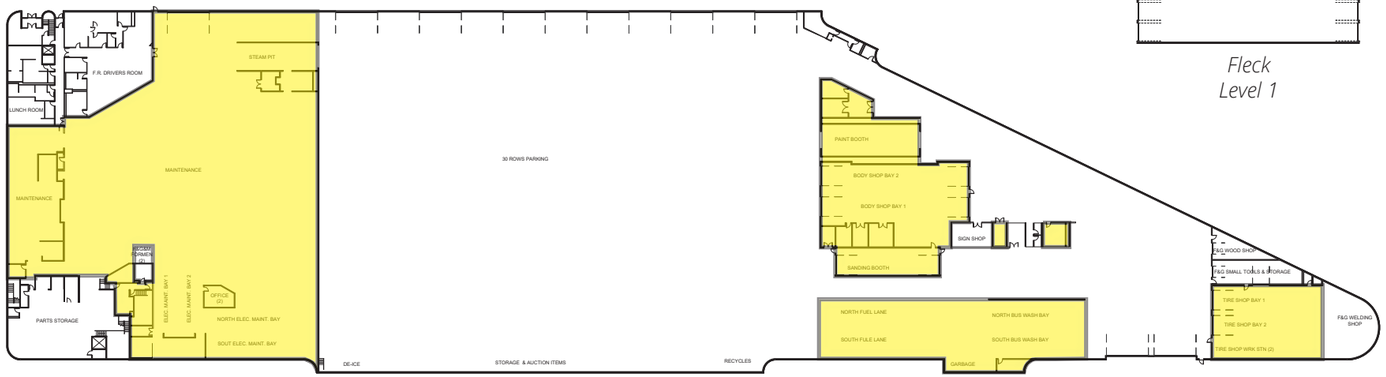


*North Boone*
*Level 1*

*Fleck*
*Level 2*



*Fleck*
*Level 1*




*South Boone Garage*
*Level 1*

# 3.1 CURRENT SPATIAL ANALYSIS & NEEDS ASSESSMENT
## FACILITIES AND GROUNDS

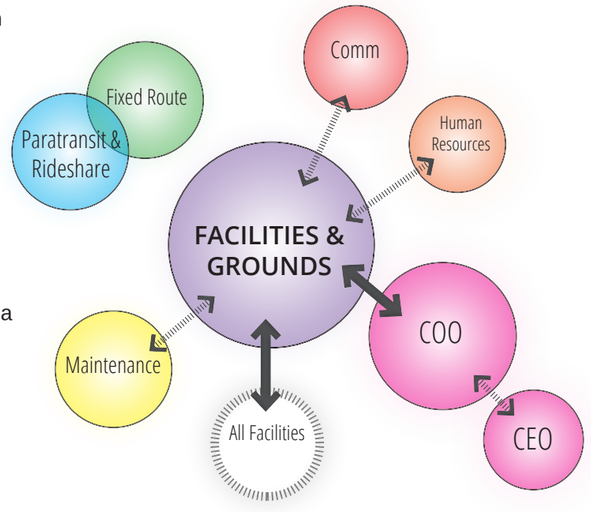
The Facilities and Grounds (F&G) department is responsible for maintaining all STA buildings, landscape, grounds, bus stops, signage, etc – basically anything that doesn't roll on rubber wheels.

With the exception of a few administrative and managerial positions who are based in an office, the majority of this department are employees who are out in the field day-to-day. Most touch base at an in-person morning meeting before heading out for the day, and from there most communication occurs over the radio and asset management or other digital needs are done through tablets in the field.

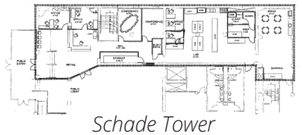
There is a small shop with shared tools and equipment in the leased space on Holland Ave., where there is also a shared break room. The metals fab shop and print shop are both undersized and there is significant need for more space for those functions. There is a need for a dedicated laydown yard, which does not currently exist. There is a fleet of F&G operations vehicles, such as plows and standard trucks and it is important to keep these separated from employee's personal vehicles. More transition space is needed to stage and store auction items (vehicles, dispensers, buses, etc.), which can be stored for up to 3 years.

There is a contracted facilities maintenance crew who is based out of the Plaza, who has daily meetings at the conference room at that location. There is a need for more parking to support operational vehicles at the Plaza.

- Anticipated Growth: In 2020 there were 35 staff in this department and in 2024 there are 37 – a growth of 6% over the past four years. Additional utilization of space in the Plaza would affect some growth in the Plaza team.
- Immediate Needs: Expanded print shop, metals fab shop and added wood fab shop, re-evaluate inventory storage approach.
- Long Term Vision: A dedicated F&G site, with warehouse and laydown area, or more satellite storage spaces throughout town; indoor parking for maintenance vehicles.

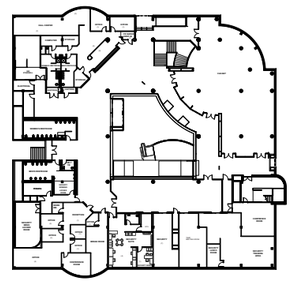


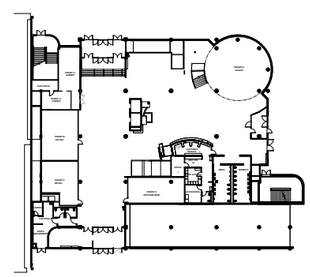

*In addition to spaces highlighted, Facilities and Grounds also utilizes leased warehouse and covered outdoor storage space at 608 E Holland*

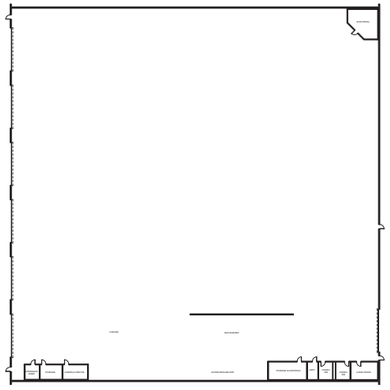

*Schade Tower*

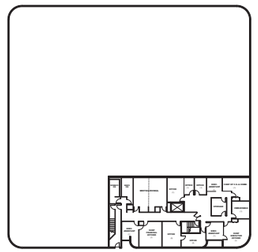

*1212 Sharp Level 2*

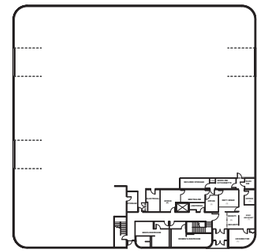

*1212 Sharp Level 1*


*Plaza Level 2*

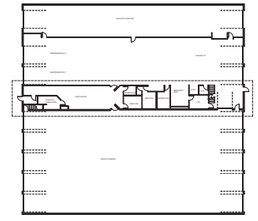

*Plaza Level 1*

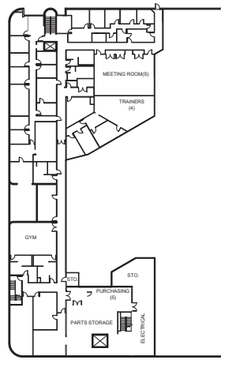

*NW Boone Garage Level 1*


*North Boone Level 2*

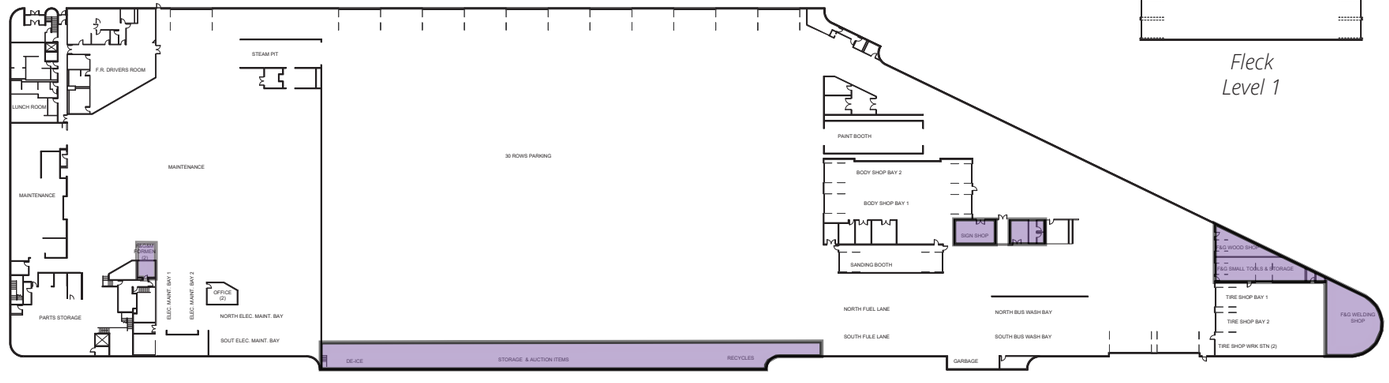

*North Boone Level 1*


*Fleck Level 2*


*Fleck Level 1*



*South Boone Garage Level 2*



*South Boone Garage Level 1*

# 3.1 CURRENT SPATIAL ANALYSIS & NEEDS ASSESSMENT
## CHIEF EXECUTIVE OFFICER AND BOARD OF DIRECTORS

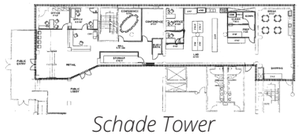
The Chief Executive Officer (CEO) is responsible for overseeing the entire organization, in coordination with the Board of Directors, an elected group of officials appointed by their respective jurisdictions, and the Community Ombudsman.

The CEO should be relatively close to all other executive Chiefs, though it is important for those Chiefs to be in close proximity to their respective departments. The CEO's office suite would include offices for assistants and the Ombudsman and attorney, along with a kitchenette, copy area and secure storage room to support. This suite would ideally be located adjacent to a Board meeting room and include two exit pathways for security.

Currently, due to the limitation on space, the room designated for STA Board of Directors meetings is also used as a training classroom. The space is deficient in its size, its ability to securely separate public visitors from STA board and executives, its aesthetic representation of STA as a professional transit authority, and its adequacy in audiovisual technology.

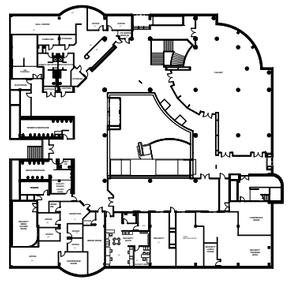
It would be ideal to have a dedicated Board meeting room that is more visible and accessible to the public, with an adjacent breakout meeting space for executive sessions. It should be able to be locked off from all other STA administrative spaces, and have a more secure configuration and proximity between public attendees and board members.

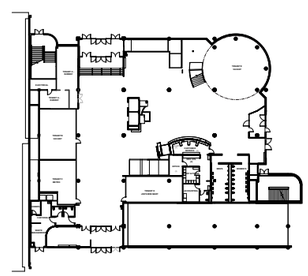
- Anticipated Growth: There is potentially slight expected growth in this area, as the positions are part of the organizational structure and should not significantly fluctuate over time or with fleet growth.
- Immediate Needs: Reconfigured Board Room space for increased safety and meeting functionality.
- Long Term Vision: An executive suite configured adjacent to the Board Room.

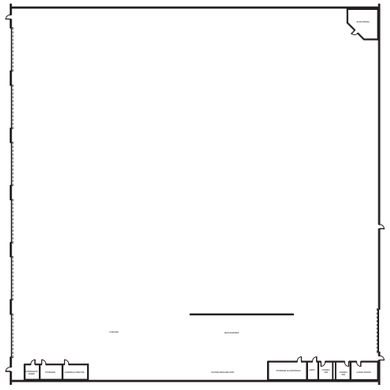


Schade Tower

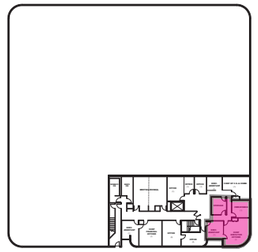

1212 Sharp
Level 2

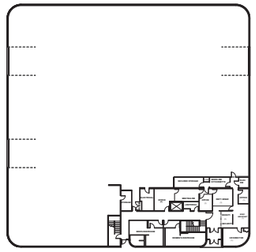

1212 Sharp
Level 1


Plaza
Level 2

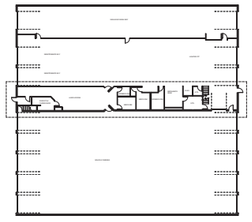

Plaza
Level 1

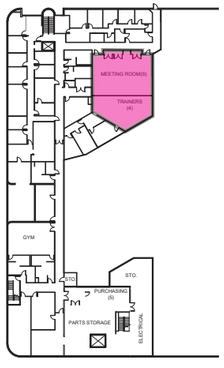

NW Boone Garage
Level 1


North Boone
Level 2

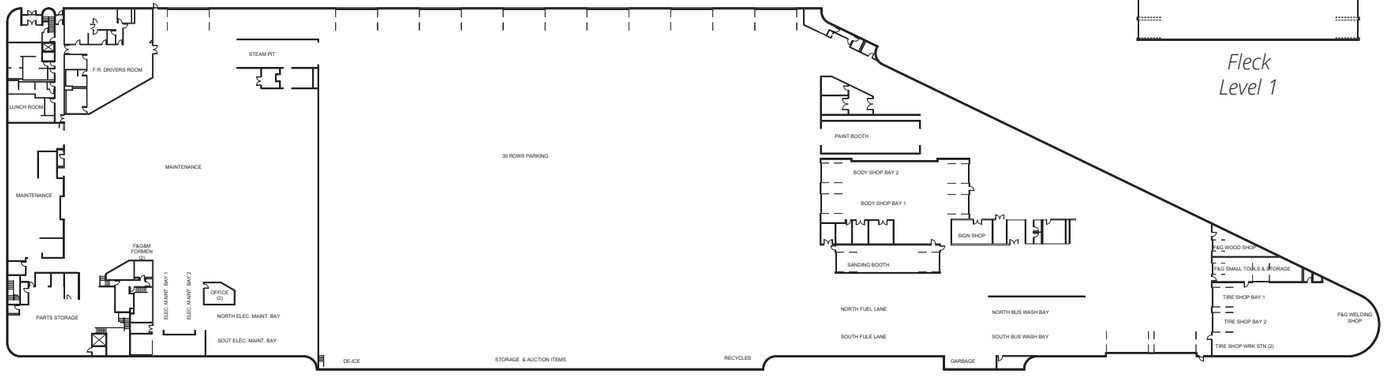

North Boone
Level 1


Fleck
Level 2


Fleck
Level 1



South Boone Garage
Level 2



South Boone Garage
Level 1

# 3.2 PROGRAMMATIC NEEDS SUMMARY

The table to the right highlights the difference between existing square footages and ideal square footages based on information gathered during work sessions and interviews with all departments summarized in the previous section. This highlights that there is currently an organization-wide space deficit of over 220,000 square feet, and that there are particularly pressing needs for shared spaces, training spaces, and parking of STA vehicles. During these work sessions, some common themes emerged as needs and desires throughout STA and are summarized as follows.

## SHARED SPACES

An overall vision of a more cohesive and collaborative culture emerged from many of the interviews, with many yearning for greater connections and seeing untapped opportunities for a more cohesive culture. The following were examples of shared spaces that do not currently exist, but which would enhance employee collaboration, wellbeing and experience, ultimately translating to greater employee productivity and retention.

**Break Room(s):** A common area for staff to take lunch or coffee breaks throughout the day. A singular approach to a break room (as opposed to numerous, more segregated break rooms) is preferred for the ways it can facilitate holistic organizational culture and camaraderie.

**Gathering Area:** A large space to house all-employee meetings and events. All-employee meetings occur three times per year, in addition to all-staff cooking events that have been ingrained in STA culture. These large gatherings can currently only be held in the bus maintenance bays, which is a disruption to the maintenance workflow.

**Wellness Spaces:** Various types of spaces to support employee wellness were identified: a physical fitness room for employee use, as well as training space for Security physical training; a medical sick room and a quiet room.

## WORKSPACES

Various workspace styles are needed for the range of employee types. Some positions require an enclosed office, while others are more suitable in an open, shared workspace. Additionally, there are several position types that do not have a permanent desk but would benefit from the ability to temporarily use a hotel-type workstation. There are also several guests that would benefit from the availability of a temporary workspace. Currently, most internal meetings are held through virtual calls at individuals' respective desks. It is envisioned that this need will diminish significantly with the addition of more meeting spaces, but some general 'quiet rooms' for someone in an open office to use for virtual calls or for more acoustically focused work.

## MEETING SPACES

Current space available for group meetings is woefully lacking. The need for additional flexible meeting space is widespread and can be shared by many departments. The following types of meeting rooms are needed.

- Small meeting spaces for 4-6
- Medium conference spaces for 10-12
- Large meeting rooms for 35-40
- Breakout areas for informal 'huddle' type meetings

## ENHANCED ENVIRONMENT

A general improvement to daylighting and thermal comfort was identified by many as a need. There are many areas where employees work without exposure to daylight or views. Aesthetically, it is desired to have more modern and professional environments reflective of the innovative work being done by STA.

## STORAGE

Generally, storage spaces throughout are lacking and in need of increase.

## PARKING

The capacity for parking vehicles of all nature is insufficient. STA fleet support vehicles, Fixed route coaches, Paratransit vans, Rideshare vehicles, operations support vehicles, auction and other vehicle staging for maintenance, as well as employee personal vehicle parking are all needing to increase.

| SPACE | DESCRIPTION | 2024 EXISTING SF | 2024 IDEAL SF | DELTA SF | % NEED |
|---|---|---|---|---|---|
| ADMIN. - PUBLIC SPACES | | **3,461 SF** | **4,670 SF** | **-1,209 SF** | **35%** |
| | Entry Vestibule w Receptionist & Security | 225 SF | 450 SF | -225 SF | 100% |
| | Board Room | 1,299 SF | 1,500 SF | -201 SF | 15% |
| | Board Conf Room | 0 SF | 250 SF | -250 SF | NEW |
| | Meeting Spaces | 1,542 SF | 1,670 SF | -128 SF | 8% |
| | Public Restrooms | 395 SF | 500 SF | -105 SF | 27% |
| | Board Restroom | 0 SF | 100 SF | -100 SF | NEW |
| | Furniture Storage | 0 SF | 200 SF | -200 SF | NEW |
| SHARED SPACES | | **13,244 SF** | **32,495 SF** | **-19,251 SF** | **145%** |
| | Conference Rooms (minus public meeting spaces) | 4,940 SF | 8,868 SF | -3,928 SF | 80% |
| | Café / Break Room / Drivers / Multi Purpose / TV | 3,413 SF | 7,451 SF | -4,038 SF | 118% |
| | Health and Wellness Spaces | 799 SF | 5,950 SF | -5,151 SF | 645% |
| | Lockers & Showers | 3,927 SF | 6,826 SF | -2,899 SF | 74% |
| | General Building Storage & Mailroom | 165 SF | 3,400 SF | -3,235 SF | 1961% |
| TRAINING | | **1,835 SF** | **36,400 SF** | **-34,565 SF** | **1884%** |
| | Classrooms and Training Areas | 1,835 SF | 8,400 SF | -6,565 SF | 358% |
| | Maintenance Training Bays | 0 SF | 28,000 SF | -28,000 SF | NEW |
| | *(Trainers' offices included in Human Resourses)* | | | | |
| ADMINISTRATION | | **25,374 SF** | **42,386 SF** | **-17,012 SF** | **67%** |
| | **Executive Wing** | **795 SF** | **1,540 SF** | **-745 SF** | **94%** |
| | **Human Resources** | **4,839 SF** | **5,650 SF** | **-811 SF** | **17%** |
| | Chief / Human Resources Offices | 1,139 SF | 1,640 SF | -501 SF | 44% |
| | Safety / Training Offices | 2,054 SF | 2,150 SF | -96 SF | 5% |
| | Security | 1,646 SF | 1,860 SF | -214 SF | 13% |
| | **Communications & Customer Service** | **5,730 SF** | **7,613 SF** | **-1,883 SF** | **33%** |
| | Chief / Communications and Marketing | 1,067 SF | 2,130 SF | -1,063 SF | 100% |
| | Business to Business | 194 SF | 360 SF | -166 SF | 86% |
| | Customer Service | 2,662 SF | 3,333 SF | -671 SF | 25% |
| | Web | 1,807 SF | 1,790 SF | 17 SF | -1% |
| | **Finance** | **10,020 SF** | **20,450 SF** | **-10,430 SF** | **104%** |
| | Chief / Payroll and Auditing | 2,219 SF | 3,120 SF | -901 SF | 41% |
| | Procurement | 6,171 SF | 11,960 SF | -5,789 SF | 94% |
| | Information Services | 974 SF | 3,140 SF | -2,166 SF | 222% |
| | Records | 656 SF | 2,230 SF | -1,574 SF | 240% |
| | **Planning & Development** | **3,990 SF** | **7,133 SF** | **-3,143 SF** | **79%** |
| | Chief / Planning and Development Offices | 350 SF | 490 SF | -140 SF | 40% |
| | Infrastructure Development | 671 SF | 1,320 SF | -649 SF | 97% |
| | Service Development | 608 SF | 1,320 SF | -712 SF | 117% |
| | Facilities Master Planning | 124 SF | 120 SF | 4 SF | -3% |
| | Capital Development | 812 SF | 1,223 SF | -411 SF | 51% |
| | BRT Development & Implementation | 114 SF | 120 SF | -6 SF | 5% |
| | Planning and Grants | 820 SF | 1,520 SF | -700 SF | 85% |
| | Community Development | 491 SF | 1,020 SF | -529 SF | 108% |
| SERVICE DELIVERY - FIXED | | **184,821 SF** | **229,077 SF** | **-44,256 SF** | **24%** |
| | COO Offices | 353 SF | 500 SF | -147 SF | 42% |
| | Supervisors and Dispatch | 2,934 SF | 3,770 SF | -836 SF | 29% |
| | ZEB Storage / Charging | 181,534 SF | 224,807 SF | -43,273 SF | 24% |
| PARATRANSIT | | **23,763 SF** | **67,229 SF** | **-43,466 SF** | **183%** |
| | Office Space | 3,419 SF | 6,629 SF | -3,210 SF | 94% |
| | Van and Rideshare Storage | 20,344 SF | 60,600 SF | -40,256 SF | 198% |
| MAINTENANCE | | **67,016 SF** | **109,728 SF** | **-42,712 SF** | **64%** |
| | Fixed Route Maintenance and Associated Office | 53,613 SF | 87,782 SF | -34,170 SF | 64% |
| | Paratransit Maintenance and Associated Office | 13,403 SF | 21,946 SF | -8,542 SF | 64% |
| FACILITIES & GROUNDS | | **25,332 SF** | **43,295 SF** | **-17,963 SF** | **71%** |
| | Office Space and Work Shops | 2,487 SF | 4,360 SF | -1,873 SF | 75% |
| | Parking of STA Vehicles | 10,000 SF | 20,000 SF | -10,000 SF | 100% |
| | Storage (Tools, Auction Items, Garbage/Rec., etc.) | 12,845 SF | 18,935 SF | -6,090 SF | 47% |
| | *(Laydown Yard included in Exterior Spaces)* | | | | |
| | **TOTALS** | **344,846 SF** | **565,280 SF** | **-220,434 SF** | **64%** |

# 3.3 FUTURE AREA NEEDS SUMMARY

After evaluating the existing programmatic needs, future area needs were analyzed to establish an overall facilities master plan program that accommodates growth out to the year 2050. The table to the right shows how a growth factor is applied to the ideal 2024 square footage to get the projected 2050 square footage. This growth factor is established based on recent growth trends paired with anticipated growth identified during interviews and work sessions with each department.

Organization-wide, projected growth equates to a growth factor of just over 50%. A large portion of this is driven by the need to nearly double the amount of storage for parking and charging of fixed route buses. This is due in large part to the impending operational changes, such as more space required between stored buses, that come with the transition from a diesel dependent bus fleet to a zero-emissions bus (ZEB) fleet. These operational changes are further expanded upon in the following section.

In total, an additional roughly 500,000 square feet of facility space beyond what STA currently occupies is needed to support STA operations in 2050. Section 4 analyzes how this total square footage gets distributed and phased over the next two decades in a variety of future operational models.

More specific and granular programming analysis is anticipated in the next phase of planning.

## EXTERIOR SPACES

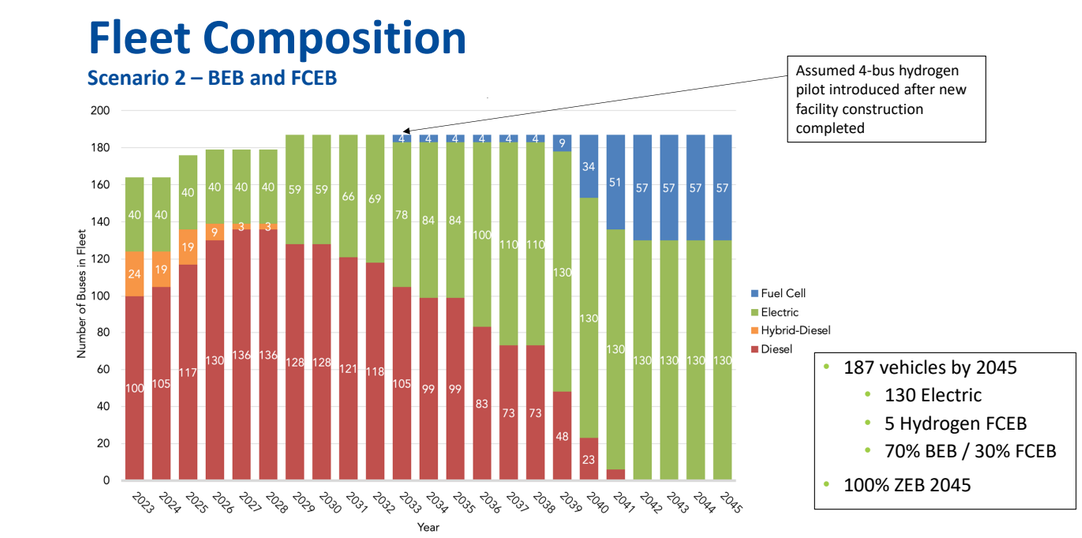
In addition to interior enclosed space, this Plan also evaluates the need for exterior spaces throughout STA. This includes shared exterior break and amenity spaces for employees to enjoy which are currently lacking at existing facilities. More utilitarian spaces, such as area for employee and visitor parking, a driver training course, and a laydown yard for Facilities and Grounds are also included. These exterior spaces are integrated into the future operational model analysis found in Section 4.

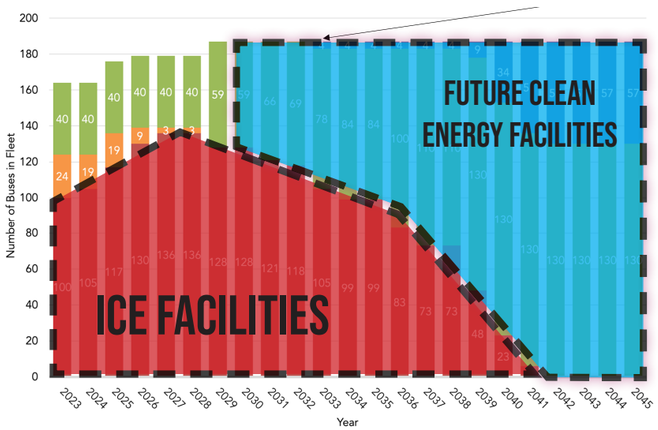
| SPACE | DESCRIPTION | 2050 PROJECTED SF |
|---|---|---|
| EXTERIOR SPACES | | |
| | Green areas for employees to gather | 12,000 SF |
| | Drivers Training Course - New = 5 acres | 217,800 SF |
| | Employee Parking - 313 Existing parking stalls - to 499 in 2050 | 189,620 SF |
| | Visitor Parking - 12 Existing parking stalls - to 18 in 2050 | 6,840 SF |
| | 380 SF per parking stall includes circulation and landscaping | |
| | Facilities & Grounds Laydown Yard | 60,000 SF |
| | **TOTAL** | **486,260 SF** |

| SYMBOL | SPACE | DESCRIPTION | 2024 IDEAL SF | GROWTH FACTOR | 2050 PROJECTED |
|---|---|---|---|---|---|
| PUB. | ADMIN. - PUBLIC SPACES | | **4,670 SF** | **15%** | **5,371 SF** |
| | | Entry Vestibule w Receptionist & Security | 450 SF | | 518 SF |
| | | Board Room | 1,500 SF | | 1,725 SF |
| | | Board Conf Room | 250 SF | | 288 SF |
| | | Meeting Spaces | 1,670 SF | | 1,921 SF |
| | | Public Restrooms | 500 SF | | 575 SF |
| | | Board Restroom | 100 SF | | 115 SF |
| | | Furniture Storage | 200 SF | | 230 SF |
| SHARE | SHARED SPACES | | **32,495 SF** | **10%** | **35,745 SF** |
| | | Conference Rooms (minus public meeting spaces) | 8,868 SF | | 9,755 SF |
| | | Café / Break Room / Drivers / Multi Purpose / TV | 7,451 SF | | 8,196 SF |
| | | Health and Wellness Spaces | 5,950 SF | | 6,545 SF |
| | | Lockers & Showers | 6,826 SF | | 7,509 SF |
| | | General Building Storage & Mailroom | 3,400 SF | | 3,740 SF |
| TR. | TRAINING | | **36,400 SF** | **10%** | **40,040 SF** |
| | | Classrooms and Training Areas | 8,400 SF | | 9,240 SF |
| | | Maintenance Training Bays | 28,000 SF | | 30,800 SF |
| | | *(Trainers' offices included in Human Resourses)* | | | |
| EXEC<br>ADMIN. | ADMINISTRATION | | **42,386 SF** | **16%** | **49,270 SF** |
| | | **Executive Wing** | **1,540 SF** | **15%** | **1,771 SF** |
| | | **Human Resources** | **5,650 SF** | **18%** | **6,684 SF** |
| | | Chief / Human Resources Offices | 1,640 SF | | 1,886 SF |
| | | Safety / Training Offices | 2,150 SF | | 2,473 SF |
| | | Security | 1,860 SF | | 2,325 SF |
| | | **Communications & Customer Service** | **7,613 SF** | **15%** | **8,789 SF** |
| | | Chief / Communications and Marketing | 2,130 SF | | 2,663 SF |
| | | Business to Business | 360 SF | | 414 SF |
| | | Customer Service | 3,333 SF | | 3,833 SF |
| | | Web | 1,790 SF | | 1,880 SF |
| | | **Finance** | **20,450 SF** | **17%** | **23,893 SF** |
| | | Chief / Payroll and Auditing | 3,120 SF | | 3,588 SF |
| | | Procurement | 11,960 SF | | 14,352 SF |
| | | Information Services | 3,140 SF | | 3,611 SF |
| | | Records | 2,230 SF | | 2,342 SF |
| | | **Planning & Development** | **7,133 SF** | **14%** | **8,134 SF** |
| | | Chief / Planning and Development Offices | 490 SF | | 515 SF |
| | | Infrastructure Development | 1,320 SF | | 1,452 SF |
| | | Service Development | 1,320 SF | | 1,452 SF |
| | | Facilities Master Planning | 120 SF | | 138 SF |
| | | Capital Development | 1,223 SF | | 1,468 SF |
| | | BRT Development & Implementation | 120 SF | | 138 SF |
| | | Planning and Grants | 1,520 SF | | 1,748 SF |
| | | Community Development | 1,020 SF | | 1,224 SF |
| 70 BUS (ZEB) | SERVICE DELIVERY - FIXED | | **229,077 SF** | **97%** | **450,167 SF** |
| 70 BUS (ZEB) | | COO Offices | 500 SF | | 525 SF |
| 70 BUS (ZEB) | | Supervisors and Dispatch | 3,770 SF | | 4,524 SF |
| | | ZEB Storage / Charging | 224,807 SF | | 445,118 SF |
| PARA. | PARATRANSIT | | **67,229 SF** | **20%** | **80,675 SF** |
| | | Office Space | 6,629 SF | | 7,955 SF |
| | | Van and Rideshare Storage | 60,600 SF | | 72,720 SF |
| MAINT. | MAINTENANCE | | **109,728 SF** | **30%** | **142,646 SF** |
| | | Fixed Route Maintenance and Associated Office | 87,782 SF | | 114,117 SF |
| | | Paratransit Maintenance and Associated Office | 21,946 SF | | 28,529 SF |
| MAINT. | FACILITIES & GROUNDS | | **43,295 SF** | **10%** | **47,625 SF** |
| | | Office Space and Work Shops | 4,360 SF | | 4,796 SF |
| | | Parking of STA Vehicles | 20,000 SF | | 22,000 SF |
| | | Storage (Tools, Auction Items, Garbage/Rec., etc.) | 18,935 SF | | 20,829 SF |
| F&G | | *(Laydown Yard included in Exterior Spaces)* | | | |
| | | **TOTALS** | **565,280 SF** | **51%** | **851,538 SF** |

# 3.4 ZEB TRANSITION

STA is underway with a transition of its fixed route fleet from a current mix of diesel, hybrid-diesel and electric, to entirely Zero Emissions Buses (ZEB) by 2045. In a 2023 update to STA's Zero Emission Bus Transition Plan, the Center for Transportation and the Environment (CTE) laid out 3 scenarios for transitioning the fleet from internal combustion engine (ICE) to Battery Electric Bus (BEB) or Fuel Cell Electric Bus (FCEB). Due to rapidly evolving technologies, as well as feasibility issues, it is currently unknown which of the scenarios will ultimately be pursued. For the purposes of this master plan, facilities should accommodate storage, maintenance and fueling for either BEBs or FCEBs.




*As the ZEB fleet grows, new Clean Energy Base facilities compatible with BEB and FCEB fueling, storage and maintenance will be needed.*

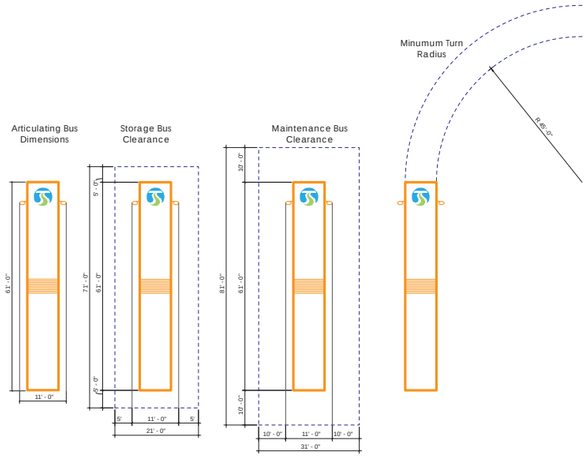
Regardless of the preferred ZEB scenario that emerges, there will be ICE buses to store, fuel and maintain until 2042, which is expected to occur at the current location at Boone South, which was designed to accommodate ICE coaches and will continue to work for this purpose, especially once the current BEBs are relocated and Boone South is generally relieved of the congestion currently experienced there.

With a changing fleet comes new and different requirements for storage, maintenance and fueling.

> **Fleet Storage:** Due to Spokane's cold winter weather and its impact on battery performance, it is not feasible to expect to store any zero emissions fleet coaches or vehicles outdoors, nor is it desired by STA. All indoor fixed route storage will need 10'-0" clearance between BEBs or FCEBs due to risk of fire. This, in addition to maneuvering clearances, is a significant space increase and has been considered in the programmed square footage.

> **Fueling:** BEBs will require on-route charging provided throughout the service area in order to supplement the mix of depot charging (plug-in, overhead pantograph, or inductive) in the garage. A significant generator yard will be necessary to power the battery charging in the event of an outage. FCEBs will be fueled by hydrogen, dispensed near a fixed or mobile storage tank. Both fueling methods are described in further detail in section 3.5.

> **Maintenance:** At least 10'-0" clear around the perimeter of a ZEB is required for adequate maintenance access. Additionally, there is a need for permanent infrastructure to provide safe access to the top of the bus in each maintenance bay. Both BEB and FCEB maintenance require overhead access.




| | Depot Charging | On Route (Conductive) | On Route (Inductive) | Fuel Cell |
|---|---|---|---|---|
| **Charge Interface** | Plug-in, overhead pantograph, or inductive at depot | Overhead pantograph and charger on-route | Overhead or in ground | On board charge via fuel cell |
| **Batteries** | Large battery packs | Smaller battery pack | Large battery packs | Smaller Battery Pack |
| **Range** | 70-200 miles | Virtually Unlimited, pending sufficient charge time on route | Virtually Unlimited, pending sufficient charge time on route | 300+ miles |
| **Charger Power** | 60 kW per BEB | 300-450 kW charger | Up to 500 kW | No charger needed |
| **Charge Time** | Full charge in ~3-4 hours | ~2.5 miles per charge minute | Range extender | ~10 minutes to full tank |

Spokane Transit Zero-Emission Board Workshop

# 3.5 ZEB FUELING

## HYDROGEN-FUELED FCEBS

As the Pacific Northwest Hydrogen Association (PNWH2) develops a hydrogen hub in our region, expected in 2035, there will be opportunity for STA to consider introducing FCEBs into the fleet. Future facilities should be able to accommodate this fueling method, should STA elect to adopt FCEBs.

> Hydrogen Storage: Whether producing or purchasing hydrogen (H2), STA would require H2 storage to supply a FCEB fleet. There are many options in this regard and the choice should be informed by the intended use of the H2. If STA would like the ability to utilize stored H2 as a back-up energy supply – either to fuel the FCEB fleet in order to accommodate BEB routes during extreme cold conditions that the BEB fleet cannot withstand, to fuel the FCEB fleet during emergency evacuation scenarios, or to supply a fuel cell back-up generator for STA facilities – then a larger capacity storage solution may be required. Otherwise, if the H2 needs only to supply a FCEB fleet during normal operation, then a smaller storage solution may suffice. Once the desired storage capacity is determined, sufficient space will need to be allocated onsite at the new clean energy base for storing and dispensing H2, whether it is in liquid, gas, or solid form.

> Hydrogen Fuel Dispensers: Refueling stations supply high pressure H2 gas to the on-board storage tanks of the FCEBs. The various storage methods outlined lead to different requirements for delivery to an FCEB.

Refueling from compressed gas storage requires only a compressor to take gaseous H2 from the tanks to the bus. In the case of material-based storage, the material must be heated (~140F) to release the adsorbed H2, but the equipment and control system for this are often included in the purchased material storage module. Following this, only a compressor is needed to deliver the gaseous H2 from storage to the bus.

Cryogenic storage requires a more extensive process than the other two since gaseous H2 needs to be delivered from liquid storage. First, a pump would be needed to move liquid H2 from the tank to a vaporizer, which would turn the liquid H2 gaseous. A compressor would then deliver the gaseous H2 from the vaporizer to the bus.

> Hydrogen Production: It is anticipated that any H2 production would be via a commercially available pre-packaged unit. These units are typically less than 450 sf in area with no interior occupiable spaces, and should be located within a conditioned enclosure for protection from extreme weather conditions.

The advantage of production over purchasing hydrogen is that the supply of hydrogen is readily available and production can be throttled up or down to meet demand. Drawbacks are that the equipment is expensive and short-lived.

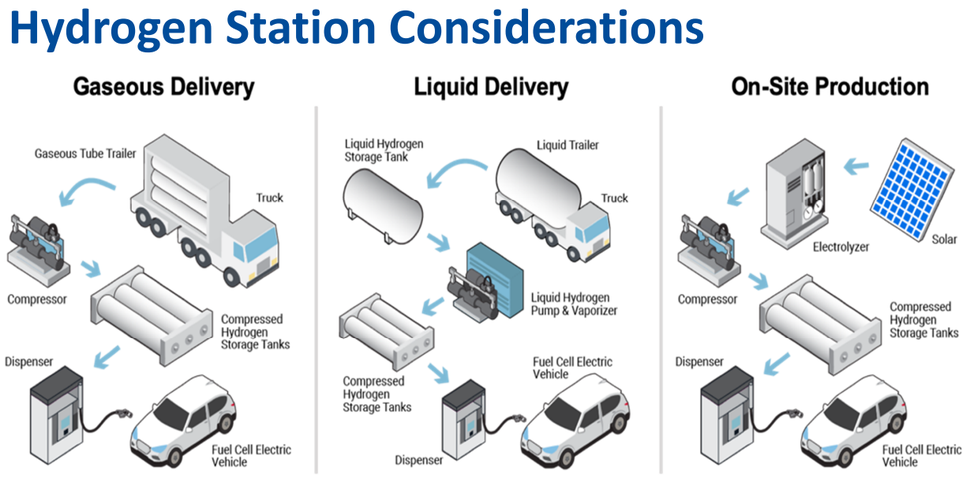



*Image source: California Fuel Cell Partnership*

## ELECTRICALLY-FUELED BEBS

STA's current ZEB fleet is comprised of BEBs. For the near future, this is the expected approach for new ZEBs. Future facilities should have the ability to accommodate charging for the entire STA fleet of coaches and operational vehicles.

> Electric Vehicle (EV) Charging Stations:

EVs, whether fully electric or plug-in hybrid, are the most deployed and mature low carbon options for regional transportation. Given the massive electrification effort of the 20th century, electricity is the most accessible type of transportation fuel, a source of fuel which is consistently being decarbonized as time goes on and as greenhouse gas emissions reporting and mandatory reductions laws and/or incentives are applied.

While BEBs are highly efficient, some have lower range than other ZEBs and some have a diminished range due to cold temperatures.

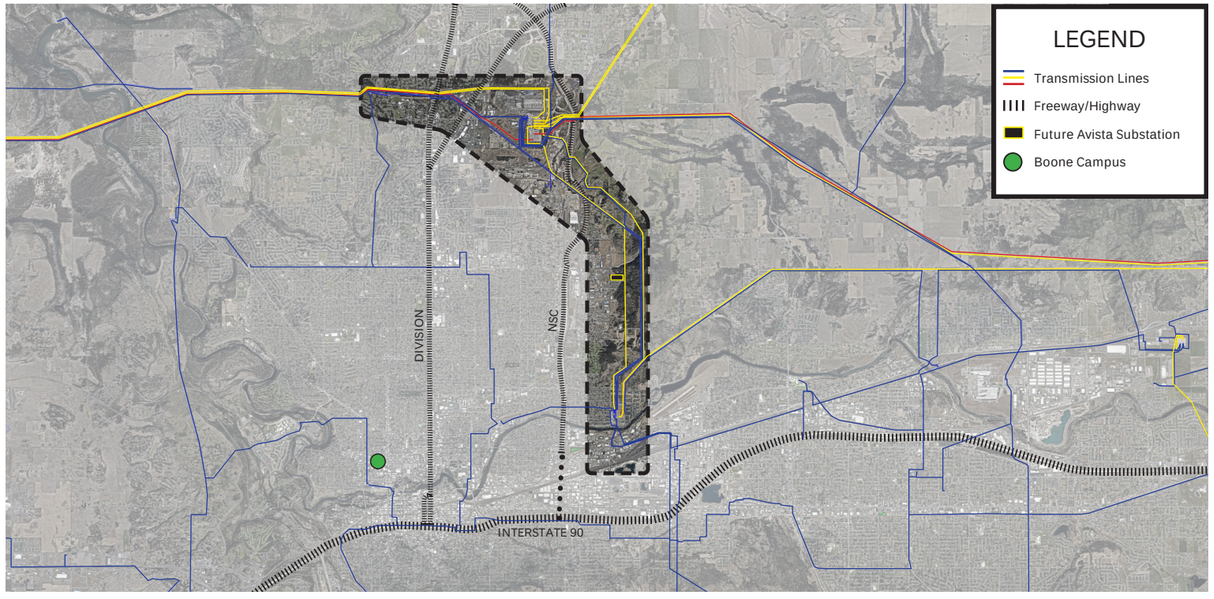
> Available Power:

Electrical utility service for a clean energy campus powering BEBs will be significant and more than likely will require expansion of the utility power distribution system.

The scale of utility improvements and project costs will be heavily dependent on the campus' proximity to the primary utility distribution lines as well as coordination with potential future planned utility development and upgrades. The map below shows existing Avista transmission lines (shown in blue, yellow and red) with a corridor highlighting areas in close proximity to available power.

Site assessment scoring, found in Section 5.0 of this report, provides an electric utility score taking into account site proximity to the primary distribution lines illustrated below.

Coordination of STA's master plan with Avista and other regional power companies master planning efforts is of utmost importance, especially when considering potential properties to locate new clean energy facilities. The following section explores alternative clean energy technologies to supplement, or possibly even replace, current available power in these new facilities.




*Concentration of Avista Utility's Power Transmission Lines*

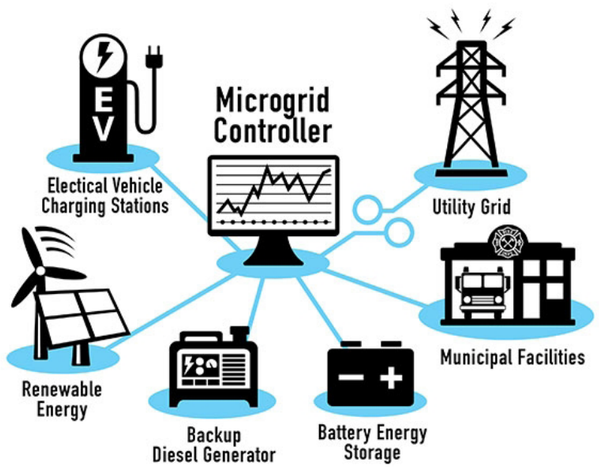
# 3.6 RESILIENCY AND SUSTAINABILITY

Resiliency is paramount for continuous operation of STA's fleet, as well as the clean energy supporting facilities, which should leverage the latest technologies, such as renewable energy and microgrids to achieve the highest feasible levels of sustainability. The following provides a brief summary of those which should be considered for implementation. A Decarbonization Technologies report can be found in Appendix III, providing additional information about these and other emerging technologies.

## RENEWABLE ENERGY SOLUTIONS

Renewable energy solutions can offer substantial benefits to any new facility reducing utility costs, while increasing energy independence and resiliency. A photovoltaic system has become the most common and efficient renewable energy option for most facilities and will be required by the latest energy codes. The small scale system required by code is a jumping off point but for each new facility, a PV study can be utilized to determine the most effective system size for peak efficiency in generation and maximum owner benefit.

Solar power can be a great benefit as a stand alone system but when paired with additional technologies like a battery storage system, a much more substantial step can be taken towards resiliency and energy independence.




- **Photovoltaic (Solar):** Photovoltaic (PV) systems have become ubiquitous with renewable energy and energy conservation policies thanks to their relative affordability and simple integration into a facility. For most commercial and industrial applications rooftop solar systems have been preferred thanks to their ability to utilize previously un-utilized space on building rooftops, parking lot canopies, etc. Washington State Energy Code currently requires the installation of a photovoltaic system for commercial facilities of the type and size that STA will be operating. Future codes will continue to increase the amount of PV generation required.
- **Energy Storage:** Energy storage refers to a range of systems that allow energy to be captured at one time, stored, and discharged at a later time to address imbalances in supply and demand. Stored electricity can be from renewable sources, or non-renewable sources on the grid. This decoupling of generation and consumption has wide-ranging applications (or "use cases") for utilities and consumers, including renewable penetration, resource adequacy, energy arbitrage, transmission and distribution upgrade deferral, transmission congestion relief, demand charge reduction, etc.

  Though there are many types of Energy Storage Systems, lithium-ion batteries are generally the most widely adopted for utility-scale storage and are relatively light weight, have high energy density, are relatively easy to deploy using standard engineering and construction techniques, and can be incorporated into existing grid infrastructure.

## MICROGRIDS

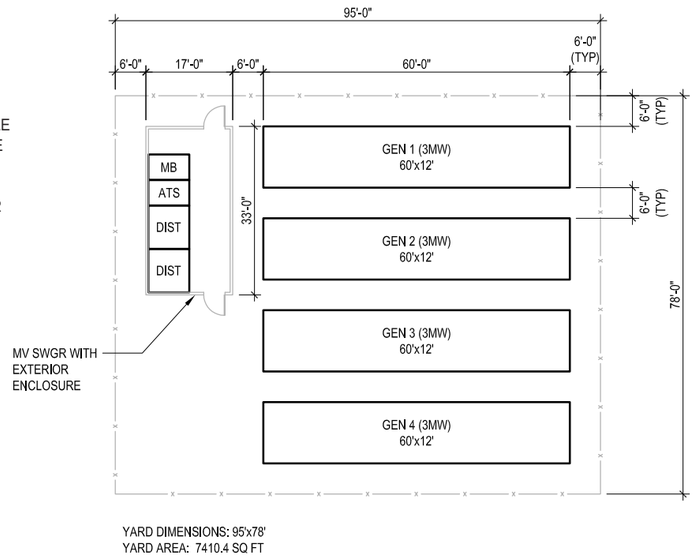
By combining renewable energy sources with traditional fossil-fuel fired generation and energy storage solutions, a microgrid provides the best solution for resiliency and flexibility at any facility or campus wide power system. Microgrids provide a layer of intelligence and control to ensure that each asset within the system is optimized and deployed in real-time, extracting the most benefit, of a fully integrated power system. An effective microgrid provides cost savings during normal operations by off-setting peak demand and time-of-use charges and provides full off-grid functionality when utility power is unavailable.

- **Microgrids:** A microgrid is a power system that is local to a specific area, controllable, and is able to operate independently of the wider grid. Many microgrids are grid-connected, but all have the capability of self-generating the power needed to meet the local demand. Microgrids can be powered by any available source, including fossil fuel-fired generators, hydropower, wind, batteries, solar or biomass, and often combine multiple generation assets of different types.

  Microgrid controls are commercially available from a wide range of suppliers, and for a wide range of applications. Some of the more common applications for microgrid controls include:
  - Improving resiliency when the utility grid is down
  - Risk mitigation for loss of product or service
  - Firming of renewable energy
  - Mitigating high cost of power
  - Energy independence
  - Overcoming timelines or capacity restrictions on new utility services
  - Reducing carbon footprint
- **Other On-Site Power Generation:** With the transition to zero emission buses, electrical charging becomes essential to service sustainability. A resilient clean energy campus should provide on-site power generation for fleet charging and critical facility loads. An estimated 8-12 megawatts of generation is required to support the clean energy campus and fleet composition as projected for 2045.

  Roughly 7,500 square feet of space on-site should be set aside for power generation as illustrated below. Diesel generators are the most cost effective solution but hydrogen fuel cells should also be considered to leverage potential benefits of hydrogen infrastructure for fuel cell buses. Natural gas generators are not viable at this scale but could be considered for small scale generation applications. Natural gas and renewable natural gas fuel cells, and energy storage as described below can also be considered.
- **Fuel Cells:** A fuel cell produces DC power by using hydrogen or natural gas as fuel. The working principle in the fuel cell is an electro-chemical reaction between hydrogen gas and oxygen from the air in the presence of a catalyst, does not include any moving parts, and results in only water vapor as the emission. Natural gas fuel cells require additional fuel processing to achieve the same process as hydrogen fuel cells, and are more carbon intensive, though carbon emissions are less than an equivalent kW or MU size diesel genset. Fuel cells are a long-duration storage option to supply uninterrupted clean power for a BEB fleet.

** NOTE: EQUIVALENT HYDROGEN FUEL CELL WITH H2 STORAGE FOR COMPARABLE 12 MW BACK-UP POWER WOULD REQUIRE APPROXIMATELY 250' x 130' (32,500 sf) OF SPACE. SEE THE FUEL CELLS PORTION OF THE TECHNOLOGIES ASSESSMENT FOR MORE INFORMATION.




*Example layout of an electrical generator yard (12 MW) that will supply backup power for resiliency in fleet fueling and facility operations.*


# 4.0 FUTURE OPERATIONS MODELS ANALYSIS

# 4.1 THE BIG IDEAS

To accommodate the over 500,000 additional square feet of program space required to support STA operations in 2050, multiple operational models were analyzed based upon the number of buses stored at each campus, or base. Each scenario was evaluated on the number of assumptions that make it possible, the opportunities it presents, and the challenges it poses. All the operational models explored fall into one of three categories:

> SINGLE BASE

All bus storage and as many of the departmental functions possible are co-located at one location, creating a large campus where most, if not all, of STA's functions would take place. Satellite campuses for specific functions, such as Training or Paratransit for example, could supplement the campus to make this model more feasible.

> DUAL CAMPUS

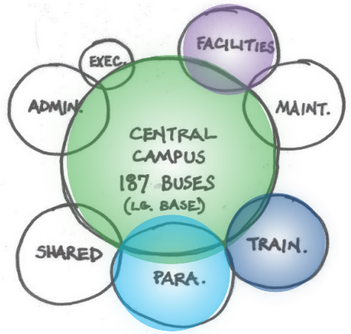
Bus storage is divided between two locations, creating two separate campuses. Bus storage could be divided equally or weighted more heavily to one campus or the other creating one larger campus and one smaller. Satellite campuses for specific functions could also supplement the dual campus model.

> NETWORK

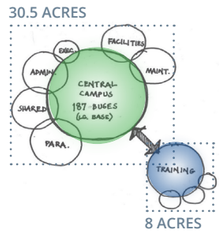
Bus storage is divided into three roughly equal bases creating a network of connected campuses. Departmental functions are dispersed amongst the three bases depending on desired adjacencies and campus location.

The following pages show one example of each operational model and how it could be implemented over the next 20 years through the acquisition of new properties and the use of existing assets. Assumptions are listed for each scenario accompanied by a discussion of its opportunities and challenges. Ultimately, a hybrid solution, called the "Modified Network" emerged as the preferred approach incorporating positive attributes from each of the operational models.

## SINGLE BASE / CENTRAL CAMPUS

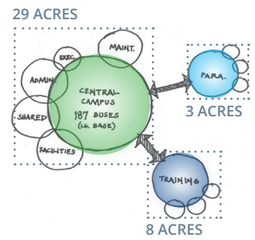



38.5 ACRES



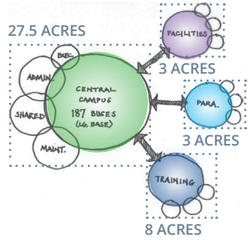

1a - TRAINING CAMPUS

40 ACRES




1b - TRAINING + PARATRANSIT CAMPUS

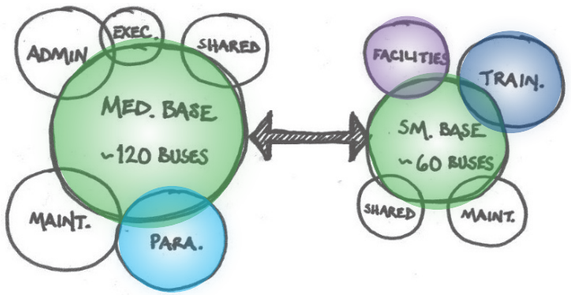
41.5 ACRES



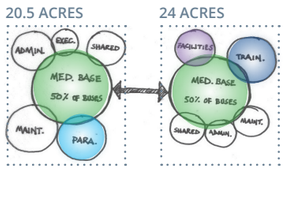

1c - TRAINING + PARATRANSIT + FACILITIES CAMPUS

*The above Single Base diagrams show various ways of supplementing the single base with satellite campuses, thereby reducing the size of site required for the central campus. As the number of satellite campuses for functions such as Training, Paratransit, and Facilities & Grounds grows, so does the number of sites and overall acreage required.*

## DUAL CAMPUS

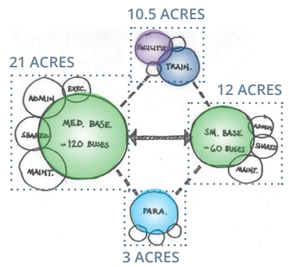



44.5 ACRES



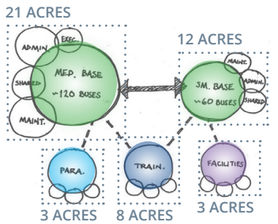

2a - EVEN SPLIT

46.5 ACRES




2b - FACILITIES/TRAINING + PARATRANSIT CAMPUS

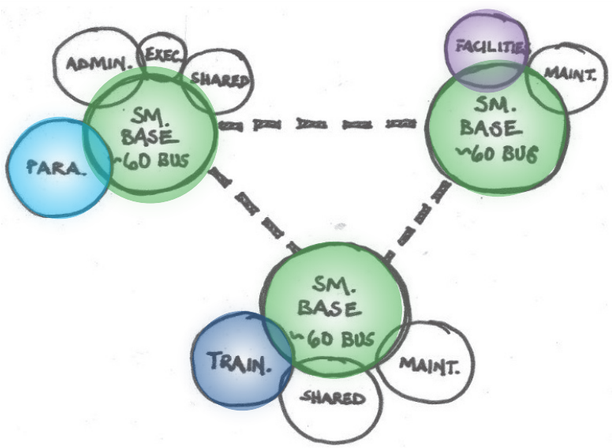
47 ACRES



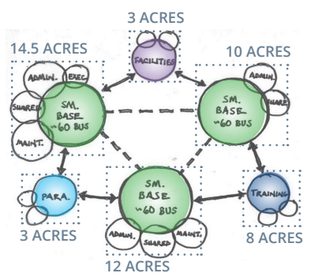

2c - TRAINING + PARATRANSIT + FACILITIES CAMPUS

*The above Dual Campus diagrams show various ways of splitting the total number of buses between two campuses. They could be split evenly between the two or in a one-third, two-thirds split creating one campus that is larger than the other. These bases can then be supplemented with satellite campuses.*

## NETWORK

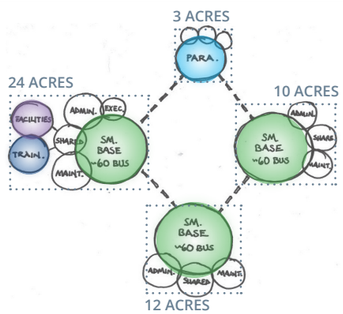



50.5 ACRES



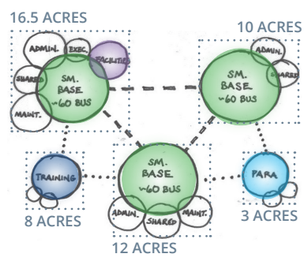

3a - TRAINING, PARATRANSIT, FACILITIES HUBS

49 ACRES




3b - HOME BASE + NETWORK

49.5 ACRES




3c - DISTRIBUTED NETWORK

*The above Network diagrams show various ways of thinking about three distributed clean energy bases, each housing one third the total number of buses. Each base could be considered a hub for functions such as Training, Paratransit, or Facilities & Grounds, or one base could be considered a primary "home" base and the others smaller.*

# 4.2 SINGLE BASE

There are many opportunities that make the single base operational model attractive to STA. Co-location of staff for quick, effective collaboration and consolidation of functions into one location being the main draw. This model does the best job of accommodating many of the departments' desire to be "all together" that came up during initial brainstorming sessions. However, the need for such a large, centrally located site to make this model a reality proves challenging.

Considering STA's desire to use existing assets to the greatest extent possible, the fact that the Boone Campus is so large and centrally located, and STA's investment and tenure there, the team studied using the Boone Campus as the site for a single base operational model. This scenario focused on how the Boone Campus could be transitioned, through renovation, expansion, and new construction, to a clean energy base housing all of STA's buses and most of their departmental functions.

## SEVERAL ASSUMPTIONS WERE MADE IN THIS SCENARIO:

- A new site minimum of 3 acres is acquired to house Paratransit
- STA acquires 1300 block (between Adams and Cedar) north of Boone
- STA acquires Spokane County property at 1300 block south of Boone
- Vacation of Adams St. north of Boone
- Vacation of Sharp Ave. west of Jefferson St.
- Demolition of 1212 Sharp building
- Demolition of North Boone (1230 Building)
- Ability to stack program and build structured parking on North Boone site
- STA acquires WSDOT property after completion of North Spokane Corridor and vacation of Thor Ct. at Mission and Greene site
- Existing Fleck facility retrofitted/expanded for Facilities and Grounds
- Fairgrounds site unused and available for land swap or sale

## THE SEQUENCE OF EVENTS ENVISIONED FOR THIS SCENARIO ARE AS FOLLOWS:

### NEAR TERM ACTIONS (2025-2030)

- Construction of new Paratransit facility on a newly acquired site
- Construction of new Training facility at Mission and Greene site
- Renovate and build out Fleck site for Facilities and Grounds
- Begin to vacate Boone by moving Administrative functions to renovated and/or leased space at the Plaza

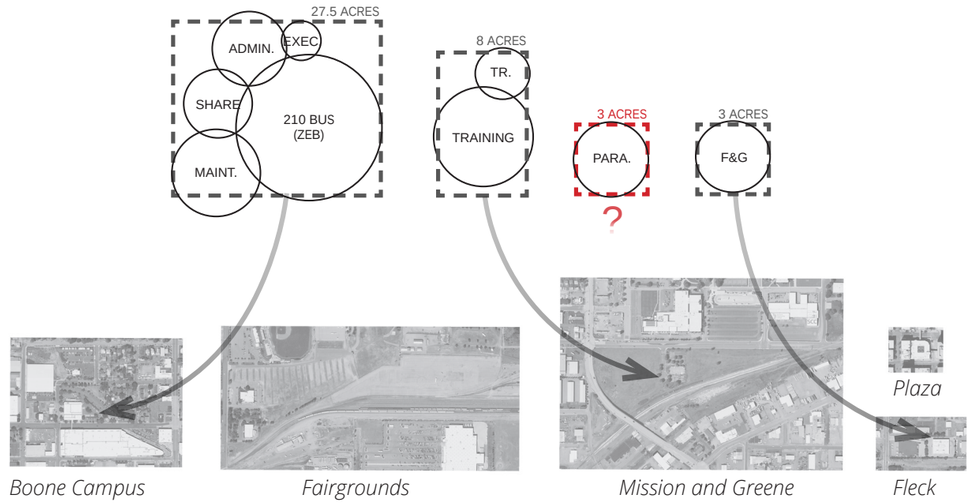
### MID-TERM ACTIONS (2030-2035)

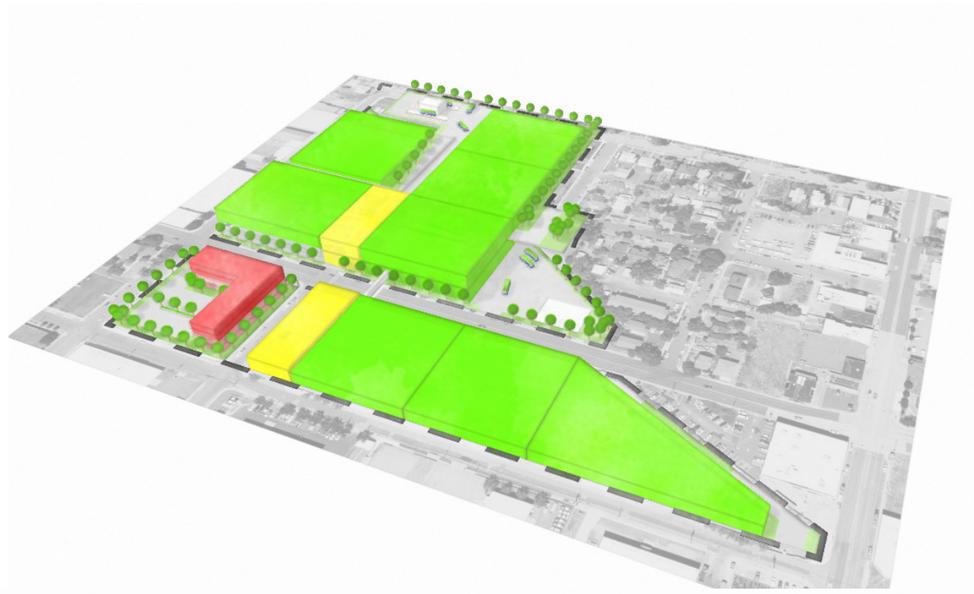
- Construction of Clean Energy Base Phase I (~140 ZEB) at north Boone site
- Move Administration and Executives to new building at north Boone site

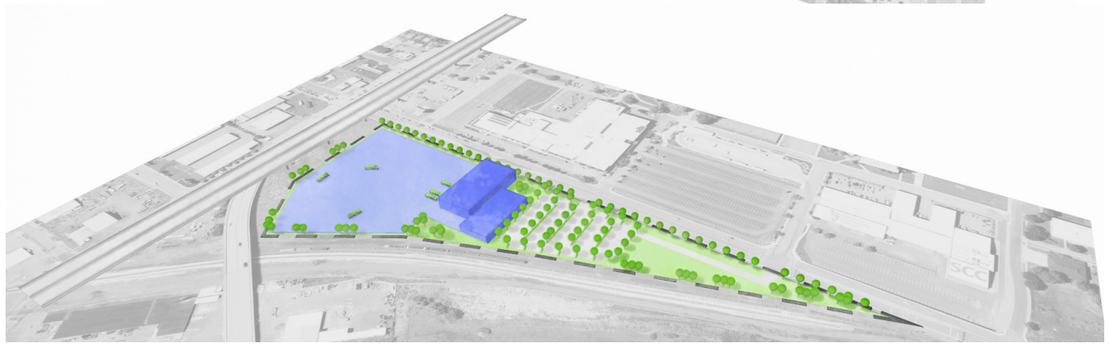
### LONG TERM ACTIONS (2035-2045)

- Renovation of south Boone site to create Clean Energy Base Phase II (~70 ZEB)

While this scenario ultimately addresses STA's desire to consolidate departments and co-locate staff, it fails to adequately address STA's immediate needs around expanded ZEB storage and additional office space. Because vacation of the Boone campus is required before renovation and retrofitting into new facilities, the timeline for new office space and ZEB storage is out 10-15 years. Additionally, the density required on the Boone campus including stacking multiple floors of bus storage, maintenance and the need for structured parking pose construction, budget and zoning challenges on the north Boone site. This scenario also would rely upon the ability to acquire adjacent properties that is not currently owned by STA. While not completely unrealistic, these challenges have made other scenarios more desirable.





# 4.3 DUAL CAMPUS

The dual campus model looks at supplementing the Boone Campus with an additional new clean energy base. Two site options were studied for the location of a new clean energy base. The first being at Mission and Greene, assuming the acquisition of the WSDOT property after the completion of the North Spokane Corridor, and the second being a newly acquired site in the 10 to 30 acre range.

The benefits of creating a new clean energy base in the near term are twofold: it addresses STA's immediate needs by providing additional office space and ZEB storage while alleviating space on the Boone campus, allowing for renovation and expansion of the Boone campus into a second clean energy base much sooner.

### SEVERAL ASSUMPTIONS WERE MADE IN THIS SCENARIO:

- A new site minimum of 25 acres (or with the ability to expand to this size) is acquired to house a new approximately 140 ZEB clean energy base
- STA acquires 1300 block (between Adams and Cedar) north of Boone
- Vacation of Adams St. north of Boone
- Vacation of Sharp Ave. west of Jefferson St.
- Demolition of 1212 Sharp building
- Demolition of North Boone (1230 Building) likely, but could be re-purposed
- Ability to stack program (Administration/Shared space over Maintenance) on North Boone site
- STA acquires WSDOT property after completion of North Spokane Corridor and vacation of Thor Ct. at Mission and Greene site
- Existing Fleck facility retrofitted/expanded for Paratransit
- Fairgrounds site unused and available for land swap or sale

### THE SEQUENCE OF EVENTS ENVISIONED FOR THIS SCENARIO ARE AS FOLLOWS:

#### NEAR TERM ACTIONS (2025-2030)

- Construction of new approximately 140 ZEB clean energy base on a newly acquired site
- Renovate and build out Fleck site for Paratransit
- Begin to vacate Boone by moving Administrative functions to renovated and/or leased space at the Plaza

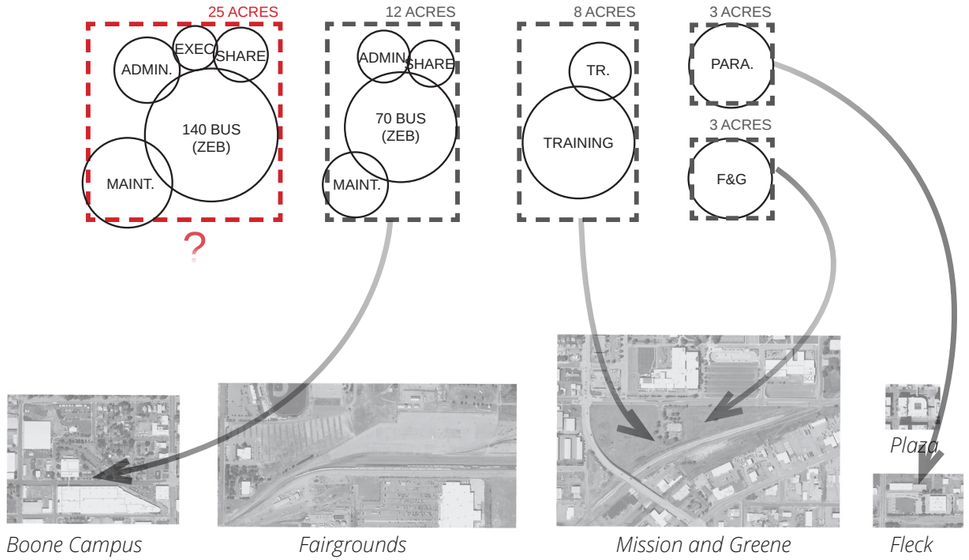
#### MID-TERM ACTIONS (2030-2035)

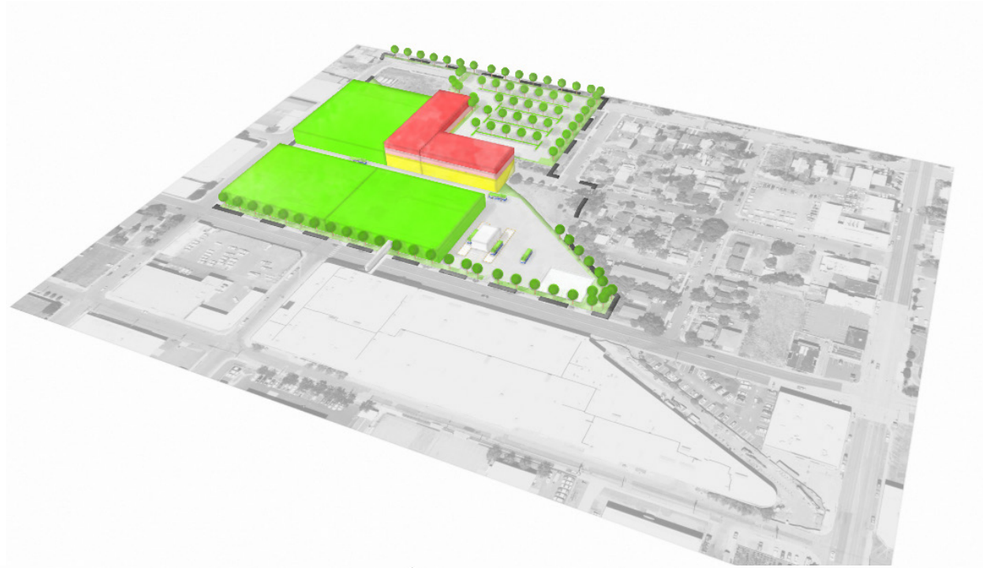
- Construction of new Training facility and new Facilities and Grounds building at Mission and Greene site
- Move Administration and Executives to new clean energy base

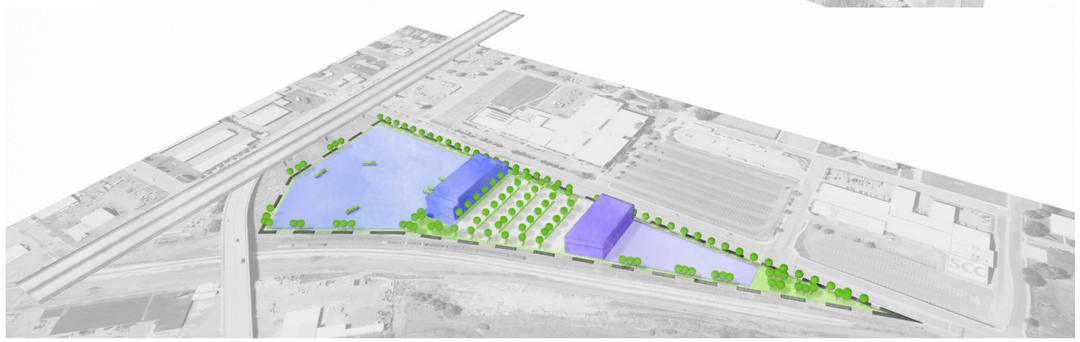
#### LONG TERM ACTIONS (2035-2045)

- Renovation of South Boone site to create Clean Energy Base (~70 ZEB)

While this scenario addresses STA's immediate needs around expanded ZEB storage, and additional office space, it poses some challenges such as the size of new site required and timing of a new training facility. To construct a new 140 ZEB clean energy base, a large newly acquired site in the range of 25-30 acres is required. Additionally, by locating Training and Facilities and Grounds at the Mission and Greene site, it requires STA to acquire the adjacent WSDOT property, which means construction timing would be dependent on the completion of the North Spokane Corridor project. In this scenario, south Boone is shown as being unoccupied and available for re-development by entities other than STA. However, this idea received unfavorable feedback from STA and has since been revised to incorporate the use of south Boone by STA functions in future iterations shown later in this document. The other ideas contained within this dual campus scenario were viewed favorably and have been incorporated into the preferred approach.





# 4.4 NETWORK

The network model looks at supplementing the Boone Campus with two additional new clean energy bases and creating a network of three campuses where ZEB storage is equally distributed. In this scenario, one of the new clean energy bases with approximately 70 ZEB storage is assumed to be located on the Mission and Greene site while the other is assumed to be located on a newly acquired site in the 10 to 23 acre range depending on the departments that get co-located with it.

The advantages of creating a network of bases are that STA's immediate needs for expanded ZEB storage, additional office space and new training facilities are met in the near term and do not necessarily require very large new site(s) to be acquired. The distributed network also puts bus storage and charging closer to the routes the buses are serving, thereby reducing deadhead distances. As in the dual campus model, the creation of a new clean energy base in the near-term alleviates space on the Boone campus allowing for renovation and expansion of the Boone campus into a third clean energy base much sooner.

## SEVERAL ASSUMPTIONS WERE MADE IN THIS SCENARIO:

- A new site in the 10 to 23 acre range is acquired to house a new approximately 70 ZEB clean energy base
- STA acquires 1300 block (between Adams and Cedar) north of Boone
- Vacation of Sharp Ave. west of Jefferson St.
- Demolition of 1212 Sharp building
- North Boone (1230 Building) retrofitted and possibly expanded to house Administration, Executives and Shared space
- Boone NW Garage retrofitted for Paratransit
- STA acquires WSDOT property after completion of North Spokane Corridor and vacation of Thor Ct. at Mission and Greene site
- Fairgrounds site unused and available for land swap or sale

## THE SEQUENCE OF EVENTS ENVISIONED FOR THIS SCENARIO ARE AS FOLLOWS:

### NEAR TERM ACTIONS (2025-2030)

- Construction of new approximately 70 ZEB clean energy base and training campus on a newly acquired site
- Begin to vacate Boone by moving Administrative functions to renovated and/or leased space at the Plaza

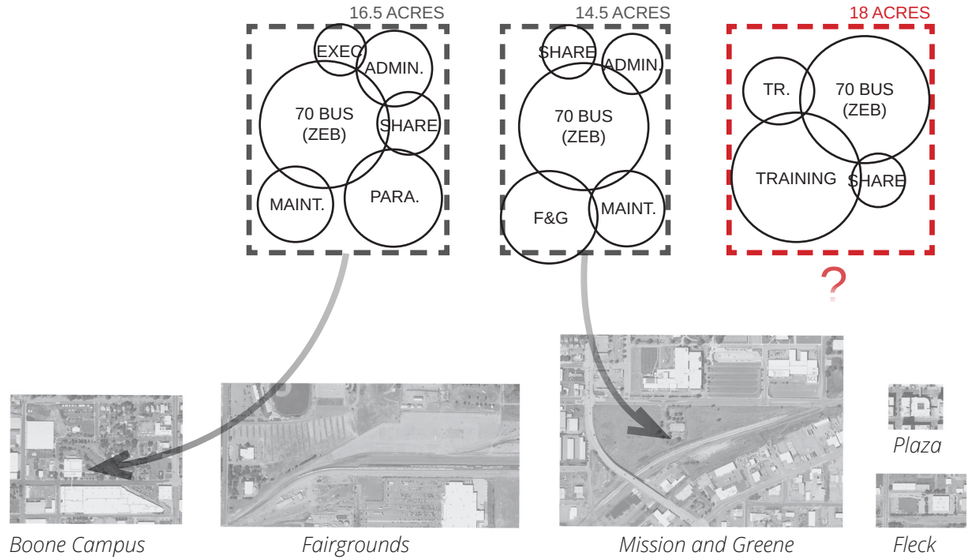
### MID-TERM ACTIONS (2030-2035)

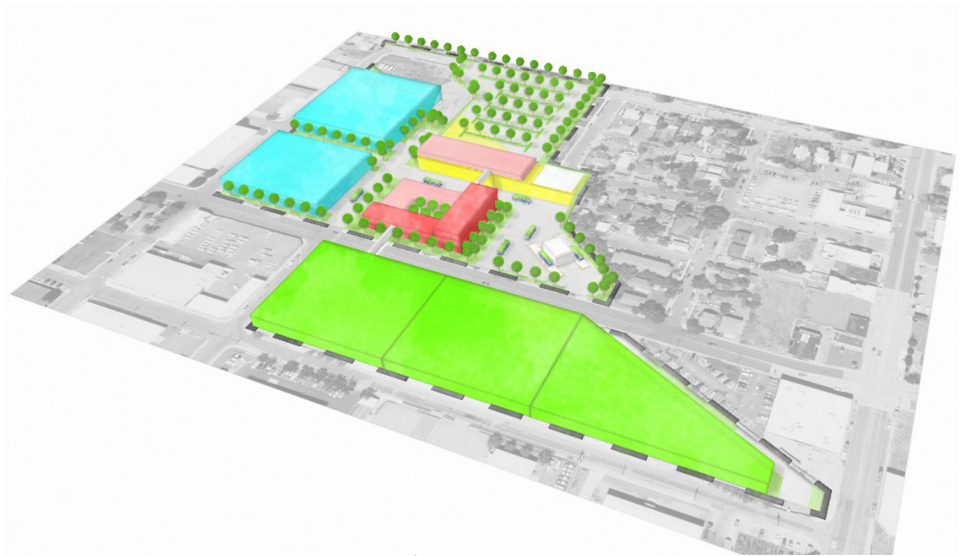
- Construction of new approximately 70 ZEB clean energy base and new facility for Facilities & Grounds at Mission and Greene site
- Renovate Boone NW Garage for Paratransit

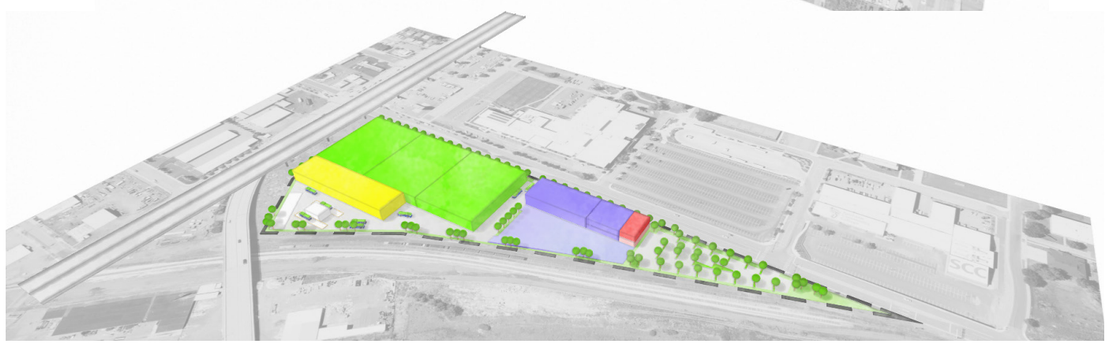
### LONG TERM ACTIONS (2035-2045)

- Renovation of South Boone site to create Clean Energy Base (~70 ZEB)

The network scenario does the best job of addressing STA's immediate needs for expanded ZEB storage, additional office space and new training facilities with the fewest number of challenges. A rather large site would be required in order to co-locate a new training facility and clean energy base, however, if a site in the 15 to 23 acre range could be acquired then new training facilities and additional ZEB storage, two of STA's most pressing needs, could be met within the first five years of the master plan. Alternatively, training and the new clean energy base could be located on two smaller, separate sites. One concern that arose from this network scenario was the amount of program being placed at the Mission and Greene site, leaving no future flexibility. The concern has been addressed in further iterations of the network scenario while also incorporating the many favorable aspects of this model into the preferred approach.





# 4.5 PREFERRED APPROACH

Based upon studying and gathering STA feedback on all three models – single base, dual campus, and network – a preferred approach, called the "modified network" was derived that incorporates positive attributes of each model. Although one large campus (single base) proved to be unfeasible, the idea of a larger, primary campus where most departmental staff is located is still desired in either the dual campus or network model. Therefore, the preferred approach incorporates a primary campus where departmental staff would be co-located at a single location and have space accommodations for temporary, or hoteling workspace at the other clean energy base location(s). Historically, this primary campus for STA has been the Boone Campus. However, the modified network approach lends itself to a primary campus at a location other than Boone, thereby creating a fresh face for STA in a modern, new building accommodating the space requirements and amenities employees have come to expect in today's workplace, and that are currently lacking at STA's existing facilities.

The advantage of creating a new "primary" campus in the initial phases of the transition to zero-emissions is twofold: the need for additional, updated office space is addressed in the near-term, and the majority of STA staff are co-located in a permanent new facility focused on the future of STA, rather than occupying leased space in an interim condition while Boone is gradually vacated and renovated.

The primary campus is envisioned taking shape in one of three potential configurations, depending on site availability, location, size and acquisition:

ON A 10-15 ACRE SITE:

> Creation of an approximately 70 ZEB clean energy base housing most of the departmental administrative program

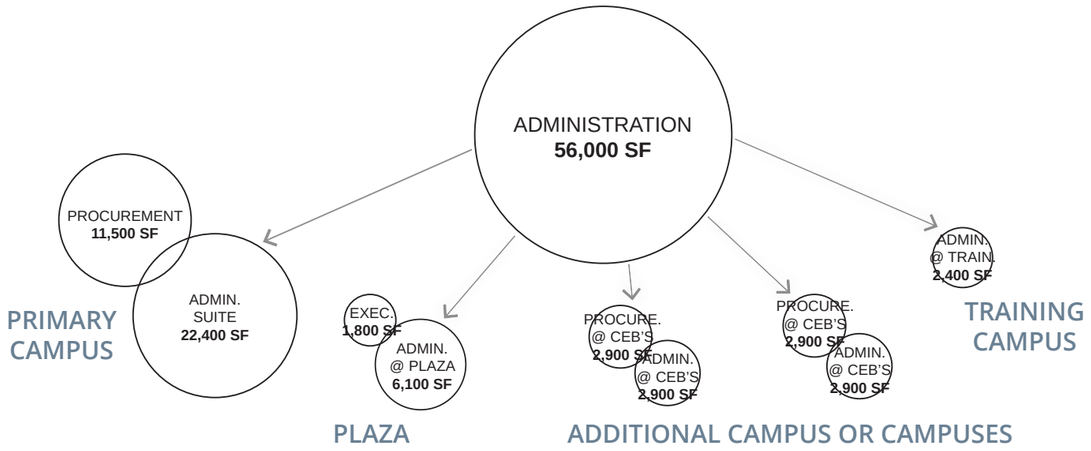
ON A 18-23 ACRE SITE, OR SITE WITH EXPANSION CAPABILITY TO REACH THIS SIZE:

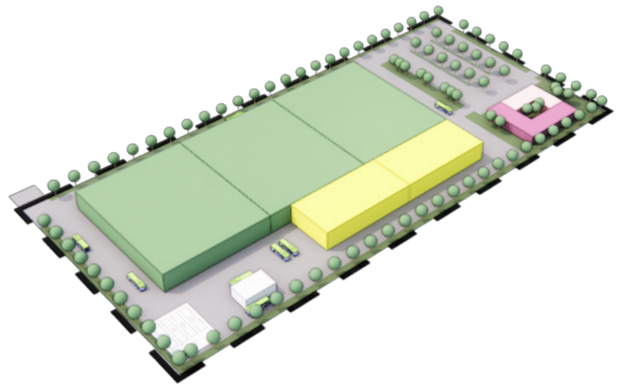
> Creation of an approximately 70 ZEB clean energy base housing most of the departmental administrative program paired with a new training facility and outdoor driver training course

ON A 25-30 ACRE SITE, OR SITE WITH EXPANSION CAPABILITY TO REACH THIS SIZE:

> Creation of an approximately 70 ZEB clean energy base housing most of the departmental administrative program initially with planned expansion to double the bus storage capacity, ultimately creating an approximately 140 ZEB clean energy campus

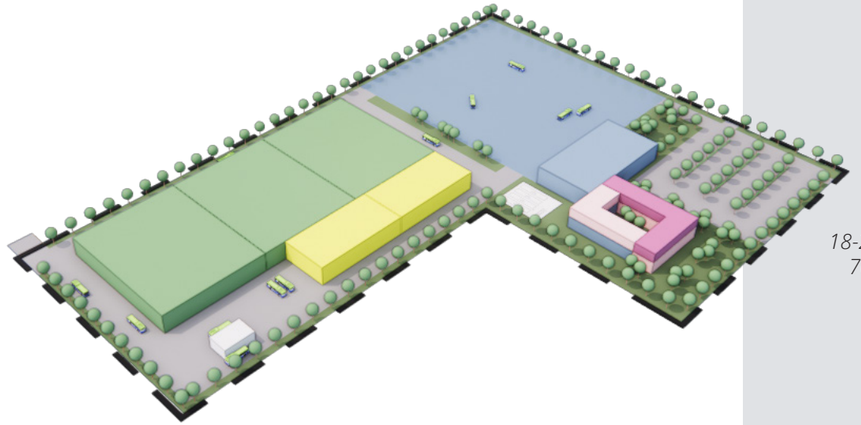
*Distribution of Administrative program creating a primary campus with the majority of departmental staff:*



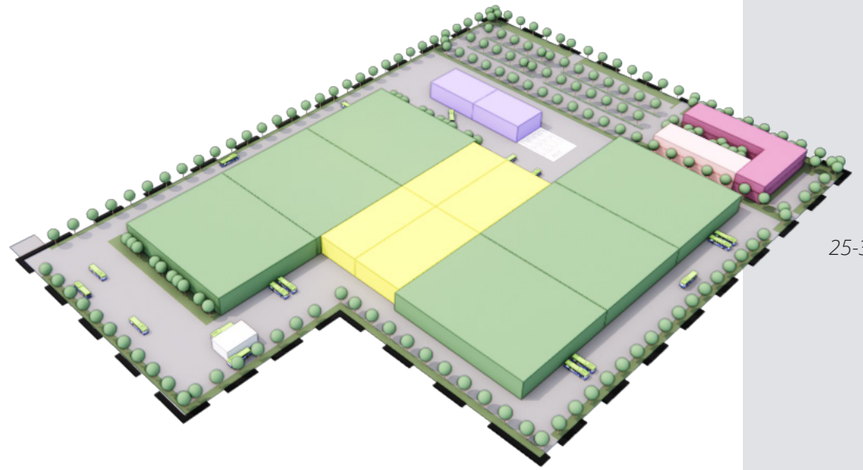
10-15
ACRES

*10-15 acre site with approximately 70 ZEB clean energy base*



18-23
ACRES

*18-23 acre site with approximately 70 ZEB clean energy base and training facility*



25-30
ACRES

*25-30 acre site with approximately 140 ZEB clean energy base*

## 4.5 PREFERRED APPROACH

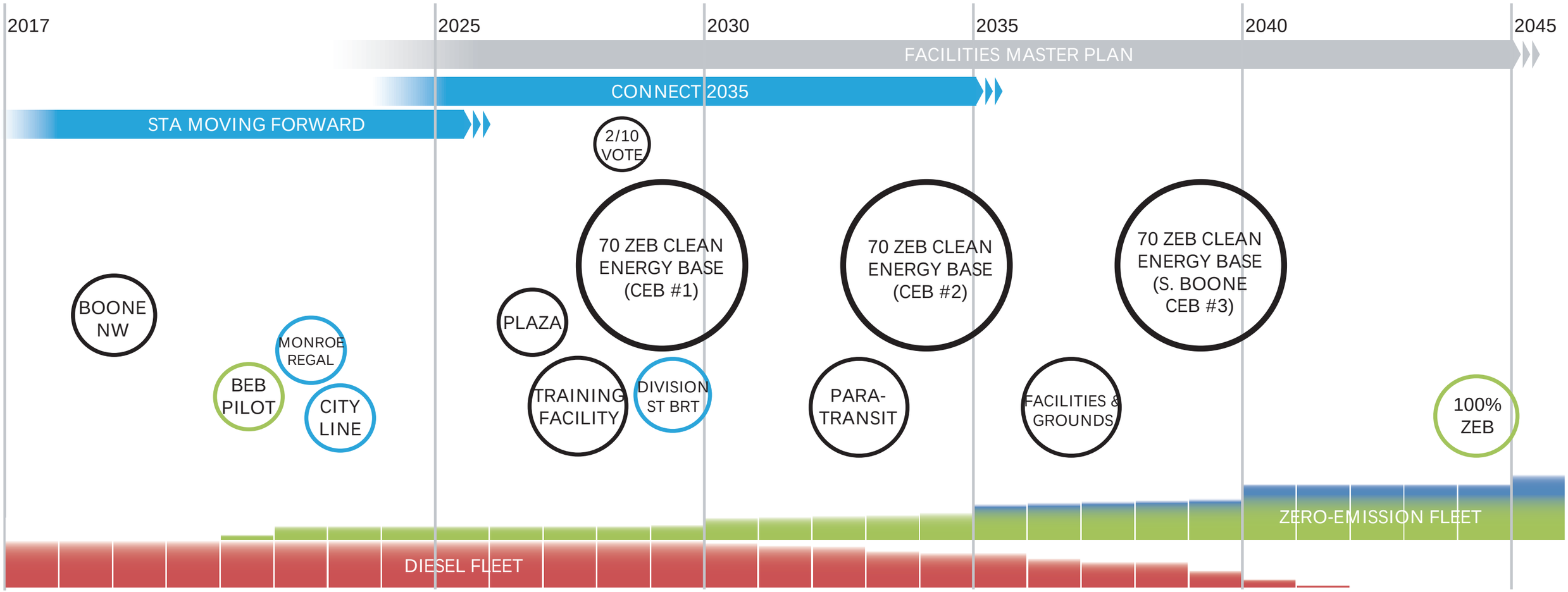
Regardless of the configuration of the initial primary campus, the sequencing of new facilities in the preferred approach remains consistent, building upon the foundational work done to date. As illustrated below, the transition to zero-emissions started with catalyst projects such as the construction of the Boone NW Garage, the introduction of Battery Electric Buses and the completion of the City Line.

The initial phase (2025-2030) of the master plan builds upon these successes by renovating the Plaza with STA program, creating a new training facility and the first 70 ZEB clean energy base. This allows ZEB storage and charging to relocate from Boone NW Garage to the new facility. Renovation of the plaza and the creation of new office space at the clean energy base alleviate space constraints at the Boone Campus and provide permanent departmental homes largely co-located with one another.

The second phase (2030-2035) supplements this with a dedicated facility for Paratransit – envisioned as a retrofit and expansion of the Boone NW Garage allowing for the potential conversion to a zero-emissions fleet – and doubles the ZEB storage capacity with an additional 70 ZEB clean energy base. This could be on another site, such as Mission and Greene, or an expansion to the initial clean energy base.

The third phase (2035-2040) then focuses on completing the renovation of the Boone Campus to a clean energy base and creating a permanent home for Facilities and Grounds which is envisioned as a renovation and potential expansion of North Boone (1230 Building). Once complete, the additional ZEB storage and charging at South Boone further supplements the ZEB storage and charging capacity allowing for the 100% transition to a zero-emissions fleet by 2045.

The following page is a high-level programming summary of how the spaces identified in Section 3.3 should be allocated amongst the five different sites within the modified network model. The scenario depicted shows Clean Energy Base #1 as the primary campus housing much of the administrative staff, however any of the three clean energy bases could be considered primary by re-allocating program space accordingly. The summary is arranged chronologically, aligning with the phases of the master plan described on this page and in the graphic below, to show how much square footage is being constructed, renovated, or retrofitted in each phase. Ultimately, this program summary will be used as a tool in the next phase of planning to determine the amount of programmed square footage at each location.



2025 — 8-10 ACRES — 18-23 ACRES — 10-15 ACRES — 25-30 ACRES — 10-15 ACRES — 2045

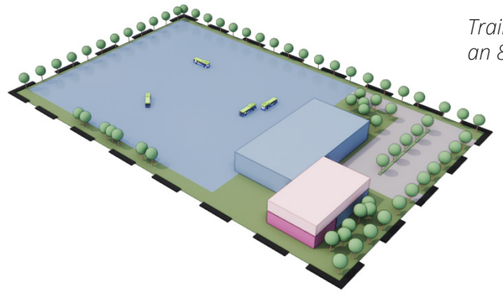
| | | TOTAL SF | PLAZA % of SF | PLAZA TOTAL SF | PLAZA YEAR | TRAINING % of SF | TRAINING TOTAL SF | TRAINING YEAR | CEB #1 % of SF | CEB #1 TOTAL SF | CEB #1 YEAR | CEB #2 % of SF | CEB #2 TOTAL SF | CEB #2 YEAR | BOONE (CEB #3) % of SF | BOONE (CEB #3) TOTAL SF | BOONE (CEB #3) YEAR | TOTAL % of SF | TOTAL |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| ADMIN. - PUBLIC SPACES | | **5,371 SF** | | **5,371 SF** | | | **0 SF** | | | **0 SF** | | | **0 SF** | | | **0 SF** | | | **5,371 SF** |
| | Entry Vestibule w Receptionist & Security | 518 SF | 100% | 518 SF | 2030 | 0% | 0 SF | | 0% | 0 SF | | 0% | 0 SF | | 0% | 0 SF | | 100% | 518 SF |
| | Board Room | 1,725 SF | 100% | 1,725 SF | 2030 | 0% | 0 SF | | 0% | 0 SF | | 0% | 0 SF | | 0% | 0 SF | | 100% | 1,725 SF |
| | Board Conf Room | 288 SF | 100% | 288 SF | 2030 | 0% | 0 SF | | 0% | 0 SF | | 0% | 0 SF | | 0% | 0 SF | | 100% | 288 SF |
| | Meeting Spaces | 1,921 SF | 100% | 1,921 SF | 2030 | 0% | 0 SF | | 0% | 0 SF | | 0% | 0 SF | | 0% | 0 SF | | 100% | 1,921 SF |
| | Public Restrooms | 575 SF | 100% | 575 SF | 2030 | 0% | 0 SF | | 0% | 0 SF | | 0% | 0 SF | | 0% | 0 SF | | 100% | 575 SF |
| | Board Restroom | 115 SF | 100% | 115 SF | 2030 | 0% | 0 SF | | 0% | 0 SF | | 0% | 0 SF | | 0% | 0 SF | | 100% | 115 SF |
| | Furniture Storage | 230 SF | 100% | 230 SF | 2030 | 0% | 0 SF | | 0% | 0 SF | | 0% | 0 SF | | 0% | 0 SF | | 100% | 230 SF |
| SHARED SPACES | | **35,745 SF** | | **1,072 SF** | | | **1,819 SF** | | | **14,534 SF** | | | **7,391 SF** | | | **13,758 SF** | | | **38,575 SF** |
| | Conference Rooms (minus public meeting spaces) | 9,755 SF | 3% | 293 SF | 2030 | | 0 SF | | 42% | 4,108 SF | 2030 | 22% | 2,159 SF | 2035 | 40% | 3,897 SF | 2040 | 107% | 10,456 SF |
| | Café / Break Room / Drivers / Multi Purpose / TV | 8,196 SF | 3% | 246 SF | 2030 | 7% | 574 SF | 2030 | 40% | 3,288 SF | 2030 | 20% | 1,650 SF | 2035 | 38% | 3,110 SF | 2040 | 108% | 8,868 SF |
| | Health and Wellness Spaces | 6,545 SF | 3% | 196 SF | 2030 | 7% | 458 SF | 2030 | 40% | 2,626 SF | 2030 | 20% | 1,318 SF | 2035 | 38% | 2,484 SF | 2040 | 108% | 7,081 SF |
| | Lockers & Showers | 7,509 SF | 3% | 225 SF | 2030 | 7% | 526 SF | 2030 | 40% | 3,012 SF | 2030 | 20% | 1,512 SF | 2035 | 38% | 2,849 SF | 2040 | 108% | 8,124 SF |
| | General Building Storage & Mailroom | 3,740 SF | 3% | 112 SF | 2030 | 7% | 262 SF | 2030 | 40% | 1,500 SF | 2030 | 20% | 753 SF | 2035 | 38% | 1,419 SF | 2040 | 108% | 4,046 SF |
| TRAINING | | **40,040 SF** | | **0 SF** | | | **40,040 SF** | | | **0 SF** | | | **0 SF** | | | **0 SF** | | | **40,040 SF** |
| | Classrooms and Training Areas | 9,240 SF | 0% | 0 SF | | 100% | 9,240 SF | 2030 | 0% | 0 SF | | 0% | 0 SF | | 0% | 0 SF | | 100% | 9,240 SF |
| | Maintenance Training Bays | 30,800 SF | 0% | 0 SF | | 100% | 30,800 SF | 2030 | 0% | 0 SF | | 0% | 0 SF | | 0% | 0 SF | | 100% | 30,800 SF |
| | *(Trainers' offices included in Human Resourses)* | | | | | | | | | | | | | | | | | | |
| ADMINISTRATION | | **49,168 SF** | | **7,877 SF** | | | **2,406 SF** | | | **33,892 SF** | | | **5,787 SF** | | | **5,787 SF** | | | **55,749 SF** |
| | Executive Wing | 1,771 SF | 100% | 1,771 SF | 2030 | | 0 SF | | 15% | 266 SF | | 15% | 266 SF | | 15% | 266 SF | | 145% | 2,568 SF |
| | Human Resources | | | | | | | | | | | | | | | | | | |
| | Chief / Human Resources Offices | 1,886 SF | 0% | 0 SF | | 0% | 0 SF | | 90% | 1,697 SF | 2030 | 10% | 189 SF | 2035 | 10% | 189 SF | 2040 | 110% | 2,075 SF |
| | Safety / Training Offices | 2,473 SF | 0% | 0 SF | | 90% | 2,225 SF | 2030 | 7% | 165 SF | 2030 | 7% | 165 SF | 2035 | 7% | 165 SF | 2040 | 110% | 2,720 SF |
| | Security | 2,325 SF | 90% | 2,093 SF | 2030 | 0% | 0 SF | | 7% | 155 SF | 2030 | 7% | 155 SF | 2035 | 7% | 155 SF | 2040 | 110% | 2,558 SF |
| | Communications & Customer Service | | | | | | | | | | | | | | | | | | |
| | Chief / Communications and Marketing | 2,663 SF | 0% | 0 SF | | 0% | 0 SF | | 90% | 2,396 SF | 2030 | 10% | 266 SF | 2035 | 10% | 266 SF | 2040 | 110% | 2,929 SF |
| | Business to Business | 414 SF | 0% | 0 SF | | 0% | 0 SF | | 100% | 414 SF | 2030 | 0% | 0 SF | 2035 | 0% | 0 SF | 2040 | 100% | 414 SF |
| | Customer Service | 3,833 SF | 100% | 3,833 SF | 2030 | 0% | 0 SF | | 0% | 0 SF | 2030 | 0% | 0 SF | 2035 | 0% | 0 SF | 2040 | 100% | 3,833 SF |
| | Web | 1,880 SF | 0% | 0 SF | | 0% | 0 SF | | 90% | 1,692 SF | 2030 | 10% | 188 SF | 2035 | 10% | 188 SF | 2040 | 110% | 2,067 SF |
| | Finance | | | | | | | | | | | | | | | | | | |
| | Chief / Payroll and Auditing | 3,588 SF | 0% | 0 SF | | 0% | 0 SF | | 90% | 3,229 SF | 2030 | 10% | 359 SF | 2035 | 10% | 359 SF | 2040 | 110% | 3,947 SF |
| | Procurement | 14,352 SF | 0% | 0 SF | | 0% | 0 SF | | 80% | 11,482 SF | 2030 | 20% | 2,870 SF | 2035 | 20% | 2,870 SF | 2040 | 120% | 17,222 SF |
| | Information Services | 3,611 SF | 5% | 181 SF | 2030 | 5% | 181 SF | 2030 | 80% | 2,889 SF | 2030 | 10% | 361 SF | 2035 | 10% | 361 SF | 2040 | 110% | 3,972 SF |
| | Records | 2,342 SF | 0% | 0 SF | | 0% | 0 SF | | 90% | 2,107 SF | 2030 | 10% | 234 SF | 2035 | 10% | 234 SF | 2040 | 110% | 2,576 SF |
| | Planning & Development | | | | | | | | | | | | | | | | | | |
| | Chief / Planning and Development Offices | 515 SF | 0% | 0 SF | | 0% | 0 SF | | 100% | 515 SF | 2030 | 0% | 0 SF | 2035 | 0% | 0 SF | 2040 | 100% | 515 SF |
| | Infrastructure Development | 1,452 SF | 0% | 0 SF | | 0% | 0 SF | | 90% | 1,307 SF | 2030 | 10% | 145 SF | 2035 | 10% | 145 SF | 2040 | 110% | 1,597 SF |
| | Service Development | 1,452 SF | 0% | 0 SF | | 0% | 0 SF | | 90% | 1,307 SF | 2030 | 10% | 145 SF | 2035 | 10% | 145 SF | 2040 | 110% | 1,597 SF |
| | Facilities Master Planning | 138 SF | 0% | 0 SF | | 0% | 0 SF | | 100% | 138 SF | 2030 | 0% | 0 SF | 2035 | 0% | 0 SF | 2040 | 100% | 138 SF |
| | Capital Development | 1,468 SF | 0% | 0 SF | | 0% | 0 SF | | 90% | 1,321 SF | 2030 | 10% | 147 SF | 2035 | 10% | 147 SF | 2040 | 110% | 1,614 SF |
| | BRT Development & Implementation | 138 SF | 0% | 0 SF | | 0% | 0 SF | | 100% | 138 SF | 2030 | 0% | 0 SF | 2035 | 0% | 0 SF | 2040 | 100% | 138 SF |
| | Planning and Grants | 1,748 SF | 0% | 0 SF | | 0% | 0 SF | | 90% | 1,573 SF | 2030 | 10% | 175 SF | 2035 | 10% | 175 SF | 2040 | 110% | 1,923 SF |
| | Community Development | 1,224 SF | 0% | 0 SF | | 0% | 0 SF | | 90% | 1,102 SF | 2030 | 10% | 122 SF | 2035 | 10% | 122 SF | 2040 | 110% | 1,346 SF |
| SERVICE DELIVERY - FIXED | | **450,167 SF** | | **0 SF** | | | **0 SF** | | | **150,983 SF** | | | **149,570 SF** | | | **149,570 SF** | | | **450,122 SF** |
| | COO Offices | 525 SF | 0% | 0 SF | | 0% | 0 SF | | 52% | 273 SF | 2030 | 24% | 126 SF | 2035 | 24% | 126 SF | 2040 | 100% | 525 SF |
| | Supervisors and Dispatch | 4,524 SF | 0% | 0 SF | | 0% | 0 SF | | 52% | 2,352 SF | 2030 | 24% | 1,086 SF | 2035 | 24% | 1,086 SF | 2040 | 100% | 4,524 SF |
| | ZEB Storage / Charging | 445,118 SF | 0% | 0 SF | | 0% | 0 SF | | 33% | 148,358 SF | 2030 | 33% | 148,358 SF | 2035 | 33% | 148,358 SF | 2040 | 100% | 445,073 SF |
| PARATRANSIT | | **80,675 SF** | | **0 SF** | | | **0 SF** | | | **0 SF** | | | **0 SF** | | | **80,675 SF** | | | **80,675 SF** |
| | Office Space | 7,955 SF | 0% | 0 SF | | 0% | 0 SF | | 0% | 0 SF | | 0% | 0 SF | | 100% | 7,955 SF | 2040 | 100% | 7,955 SF |
| | Van and Rideshare Storage | 72,720 SF | 0% | 0 SF | | 0% | 0 SF | | 0% | 0 SF | | 0% | 0 SF | | 100% | 72,720 SF | 2040 | 100% | 72,720 SF |
| MAINTENANCE | | **142,646 SF** | | **0 SF** | | | **0 SF** | | | **45,647 SF** | | | **34,235 SF** | | | **62,764 SF** | | | **142,646 SF** |
| | Fixed Route Maintenance and Associated Office | 114,117 SF | 0% | 0 SF | | 0% | 0 SF | | 40% | 45,647 SF | 2030 | 30% | 34,235 SF | 2035 | 30% | 34,235 SF | 2040 | 100% | 114,117 SF |
| | Paratransit Maintenance and Associated Office | 28,529 SF | 0% | 0 SF | | 0% | 0 SF | | | 0 SF | | | 0 SF | | 100% | 28,529 SF | 2040 | 100% | 28,529 SF |
| FACILITIES & GROUNDS | | **47,625 SF** | | **959 SF** | | | **2,381 SF** | | | **9,525 SF** | | | **9,525 SF** | | | **28,095 SF** | | | **50,485 SF** |
| | Office Space and Work Shops | 4,796 SF | 20% | 959 SF | 2030 | 5% | 240 SF | 2030 | 20% | 959 SF | 2030 | 20% | 959 SF | | 50% | 2,398 SF | 2040 | 115% | 5,515 SF |
| | Parking of STA Vehicles | 22,000 SF | 0% | 0 SF | | 5% | 1,100 SF | 2030 | 20% | 4,400 SF | 2030 | 20% | 4,400 SF | | 60% | 13,200 SF | 2040 | 105% | 23,100 SF |
| | Storage (Tools, Auction Items, Garbage/Rec., etc.) | 20,829 SF | 0% | 0 SF | | 5% | 1,041 SF | 2030 | 20% | 4,166 SF | 2030 | 20% | 4,166 SF | | 60% | 12,497 SF | 2040 | 105% | 21,870 SF |
| | *(Laydown Yard included in Exterior Spaces)* | | | | | | | | | | | | | | | | | | |
| | OVERALL BUILDING SUBTOTALS | | | 15,279 SF | | | 46,646 SF | | | 254,581 SF | | | 206,508 SF | | | 340,649 SF | | | 863,664 SF |
| SUPPORT SPACES, ETC. | | 10% of TOTAL SF | | 1,528 SF | 2030 | | 4,665 SF | 2030 | | 25,458 SF | 2030 | | 20,651 SF | 2035 | | 34,065 SF | 2040 | | 86,366 SF |
| | Fire, Mechanical, Electrical, Com, Janitorial<br>Building Circulation, Restrooms<br>Exterior Walls, shafts, etc. | | | | | | | | | | | | | | | | | | |
| | **OVERALL BUILDING TOTALS** | | | **16,807 SF** | | | **51,311 SF** | | | **280,039 SF** | | | **227,159 SF** | | | **374,714 SF** | | | **950,030 SF** |
| EXTERIOR SPACES | | | | | | | | | | | | | | | | | | | |
| | Green areas for employees to gather | 12,000 SF | 0% | 0 SF | | 7% | 840 SF | 2030 | 40% | 4,814 SF | 2030 | 20% | 2,416 SF | 2035 | 38% | 4,553 SF | 2040 | 105% | 12,623 SF |
| | Drivers Training Course - New = 5 acres | 217,800 SF | 0% | 0 SF | | 100% | 217,800 SF | 2030 | 0% | 0 SF | | 0% | 0 SF | | 0% | 0 SF | | 100% | 217,800 SF |
| | Employee Parking - 313 Existing parking stalls - to 499 in 2050 | 189,620 SF | 0% | 0 SF | | 7% | 13,273 SF | 2030 | 40% | 76,067 SF | 2030 | 20% | 38,174 SF | 2035 | 38% | 71,951 SF | 2040 | 105% | 199,466 SF |
| | Visitor Parking - 12 Existing parking stalls - to 18 in 2050<br>380 SF per parking stall includes circulation and landscaping | 6,840 SF | 0% | 0 SF | | 7% | 479 SF | 2030 | 40% | 2,744 SF | 2030 | 20% | 1,377 SF | 2035 | 38% | 2,595 SF | 2040 | 105% | 7,195 SF |
| | Facilities & Grounds Laydown Yard | 60,000 SF | 0% | 0 SF | | 0% | 0 SF | | 0% | 0 SF | | 0% | 0 SF | | 100% | 60,000 SF | 2040 | 100% | 60,000 SF |
| | EXTERIOR SPACE TOTALS | | | 0 SF | | | 232,392 SF | | | 83,625 SF | | | 41,967 SF | | | 139,100 SF | | | 497,085 SF |

# 4.5 PREFERRED APPROACH

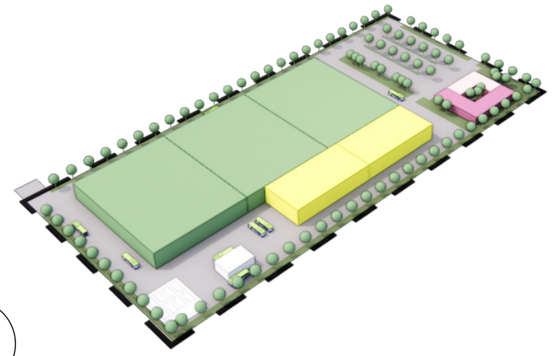
The configuration of the primary campus in the initial phase will determine whether the ultimate build-out of the master plan occupies four or five sites in either a dual campus or network model. Three potential outcomes are possible:

## SCENARIO 1: 10-15 ACRE INITIAL SITE

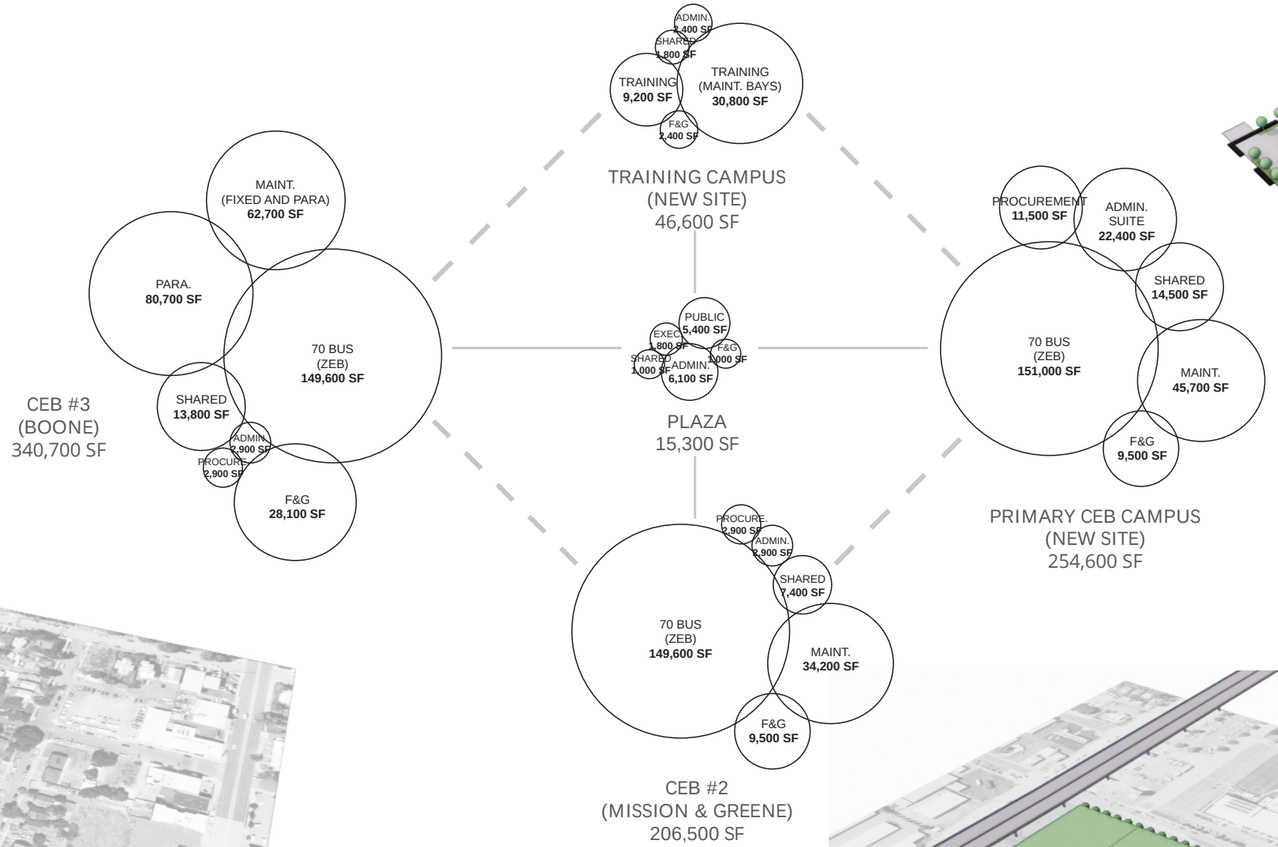
In this scenario, a network of three separate clean energy bases, each housing approximately 70 ZEB, are created; one being the primary campus on the initial 10-15 acre site (2030), one at the Mission and Greene site once the North Spokane Corridor is complete (2035), and one at the Boone Campus once diesel buses are completely phased out and the campus is renovated (2040). In addition to the three clean energy bases, a separate site in the 8-10 acre range is required for a new training facility and outdoor driver training course. This scenario requires the greatest number of sites, five total including the renovated Plaza, but no sites over 15 acres in size.

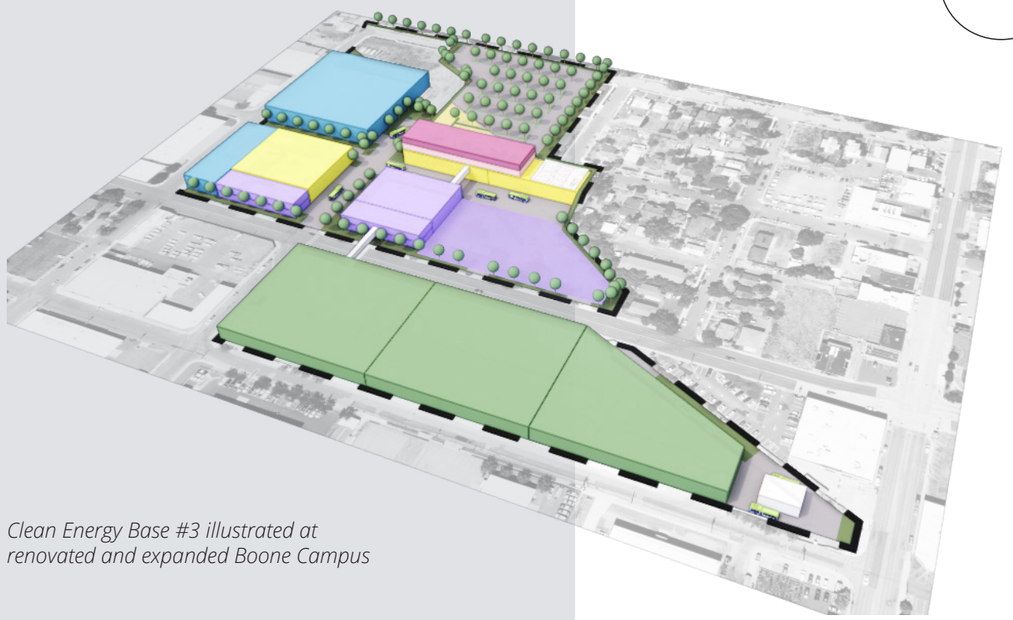


*Training campus illustrated on an 8-10 acre site*



*Clean Energy Base #1 illustrated on a 10-12 acre site*



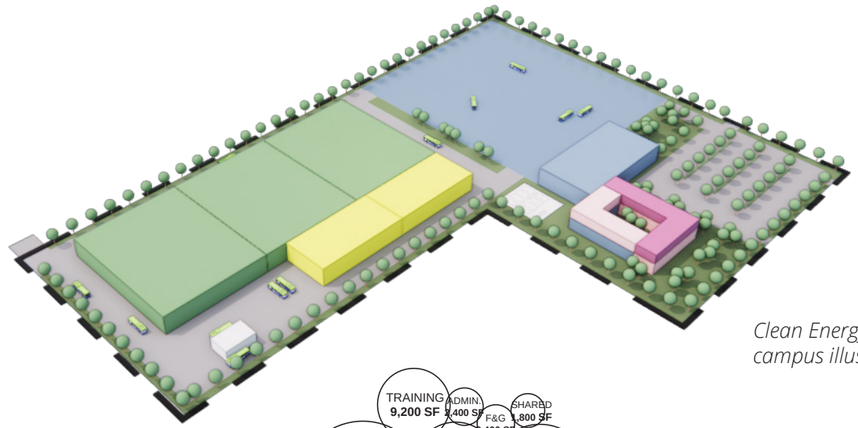
*Clean Energy Base #3 illustrated at renovated and expanded Boone Campus*

*Clean Energy Base #2 illustrated on Mission and Greene site*

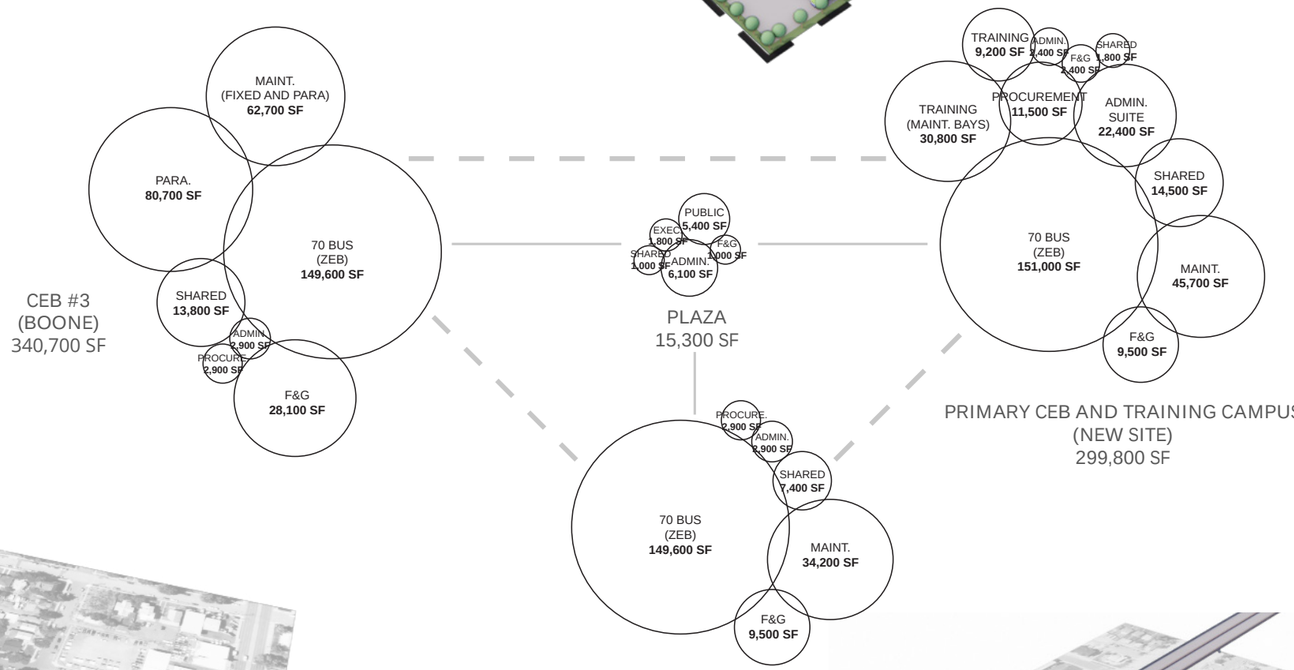
# 4.5 PREFERRED APPROACH

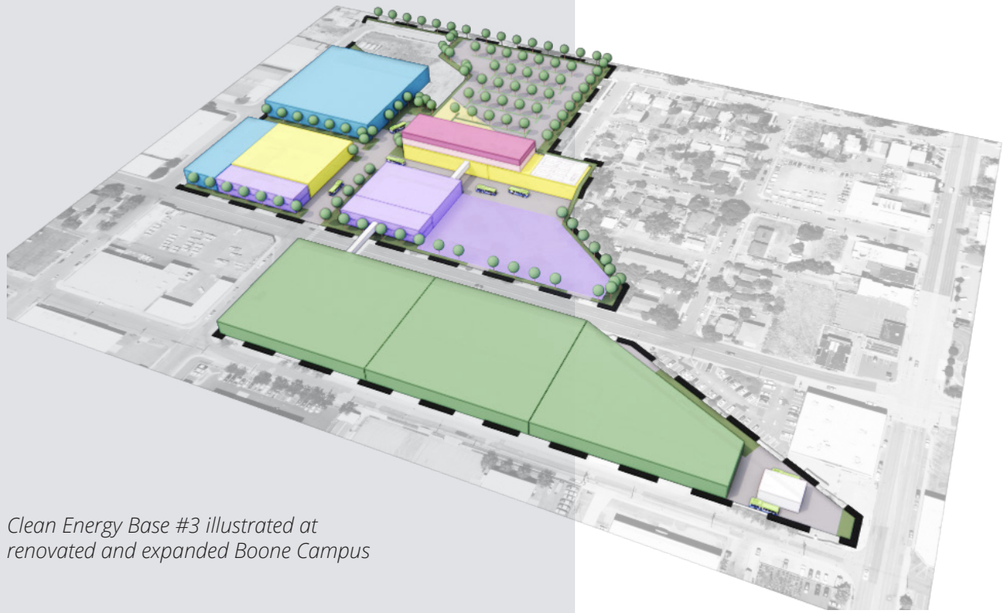
## SCENARIO 2: 18-23 ACRE INITIAL SITE

In this scenario, a network of three separate clean energy bases, each housing approximately 70 ZEB, are created like in scenario one. However, the initial primary campus is paired with a new training facility on the same 18-23 acre site. These could be constructed simultaneously in the initial phase (2030) or done in sequential steps. By grouping the training facility with the primary clean energy base, an even greater synergy is created through co-locating additional staff and providing easy access to training spaces. The total number of sites in this scenario is reduced to four with the largest site required being 18-23 acres.



*Clean Energy Base #1 and Training campus illustrated on an 18-20 acre site*



*Clean Energy Base #3 illustrated at renovated and expanded Boone Campus*

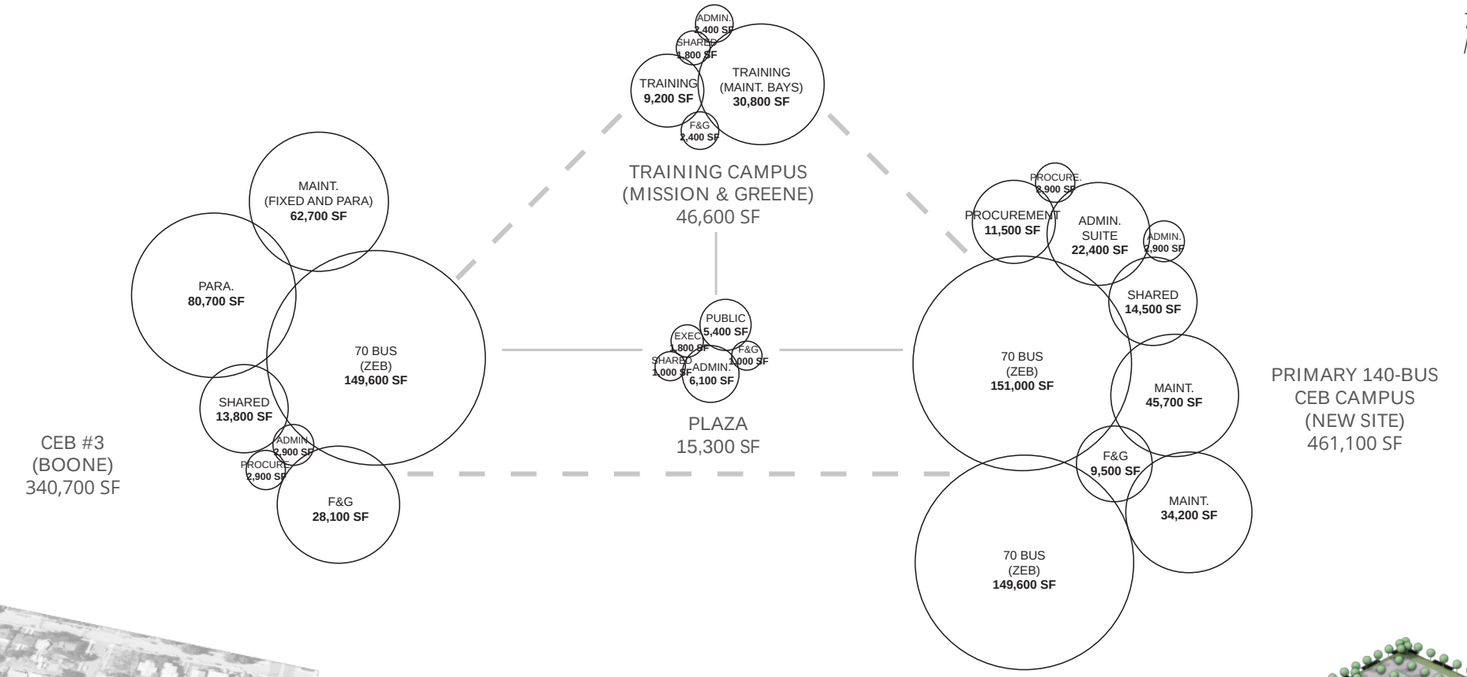
*Clean Energy Base #2 illustrated on Mission and Greene site*

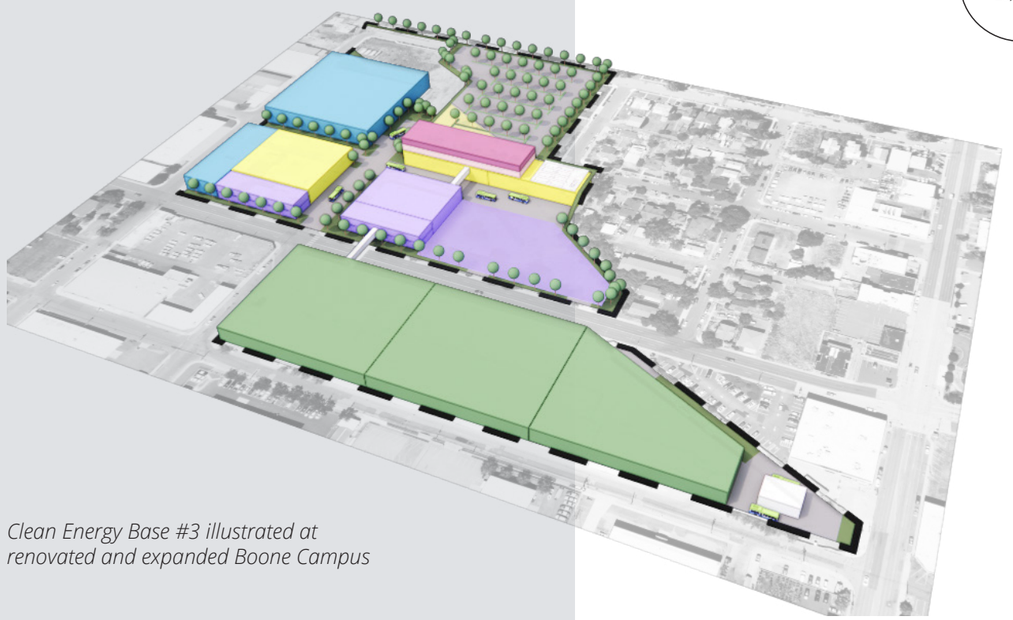
# 4.5 PREFERRED APPROACH

## SCENARIO 3: 25-30 ACRE INITIAL SITE

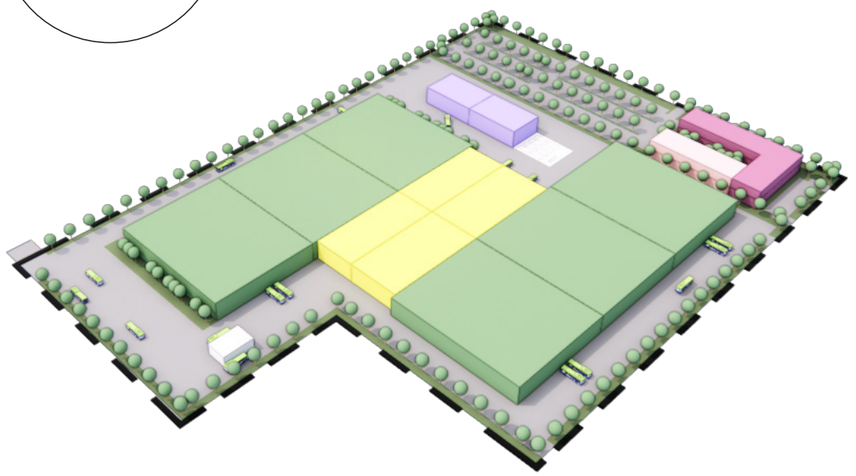
In this scenario, a dual campus of clean energy bases, one housing 2/3 of the bus storage and one housing 1/3, is created. In the initial phase (2030) a new 70 ZEB clean energy base is constructed much like in scenarios one and two, however the initial primary base is located on a site that is 25-30 acres or has the capability to reach this size in the future, to allow for a subsequent phase (2035) expansion creating a 140 total ZEB clean energy base. Because bus storage and charging is consolidated to two sites; one being on a large newly acquired site and one being the renovated Boone Campus, the Mission and Greene site is available for a new training facility and outdoor driver training course. Although large, the 25-30 acre site would be the only new site acquisition required in this scenario.

*Training campus illustrated on Mission and Greene site*

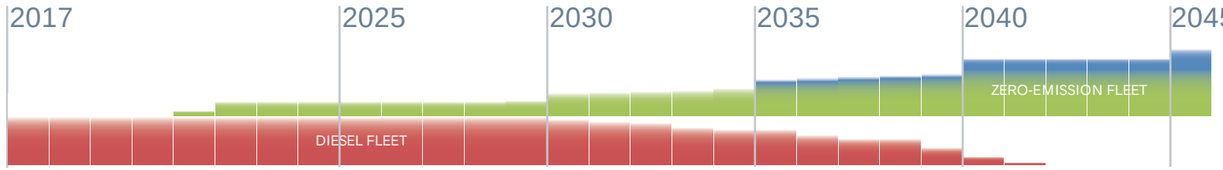


*Clean Energy Base #3 illustrated at renovated and expanded Boone Campus*



*Clean Energy Base #1+2 illustrated on a 25 acre site*



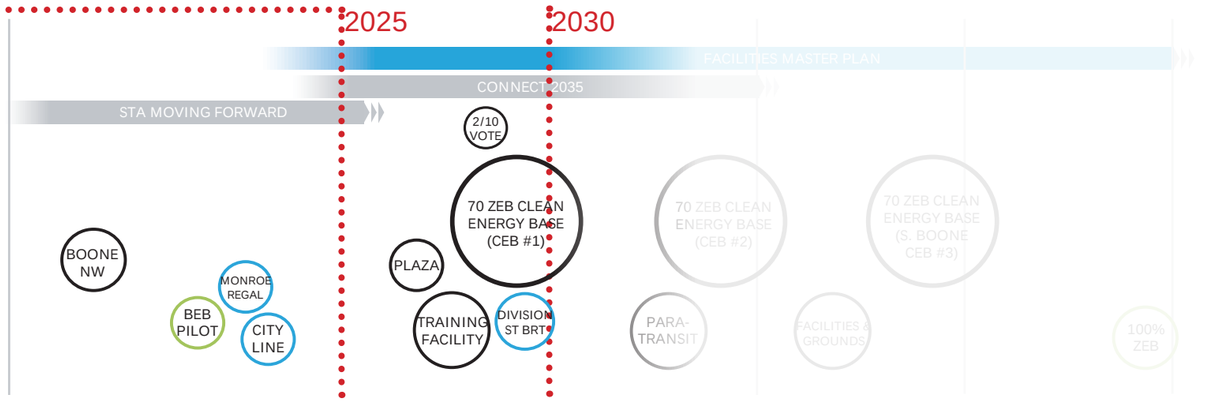

## THE INITIAL PHASE (2025-2030) PLAZA | TRAINING | CLEAN ENERGY BASE

In the initial phase of the master plan, the Plaza is renovated into a home for the public administrative functions including the Board Room and associated spaces, as well as a remote executive wing of STA. A new Training facility and clean energy base housing approximately 70 zero-emissions buses will also be constructed as part of this initial phase in one of three scenarios (see preceding pages):

SCENARIO 1: - Training facility constructed on a newly acquired 8-10 acre site
- 70-ZEB clean energy base constructed on a newly acquired 10-15 acre site

SCENARIO 2: - Training facility and 70-ZEB clean energy base constructed on the same newly acquired 18-23 acre site

SCENARIO 3: - Training facility constructed on a newly acquired 8-10 acre site, or at Mission & Greene
- 70-ZEB clean energy base constructed on a newly acquired 25-30 acre site as the initial phase of a 140-ZEB clean energy base

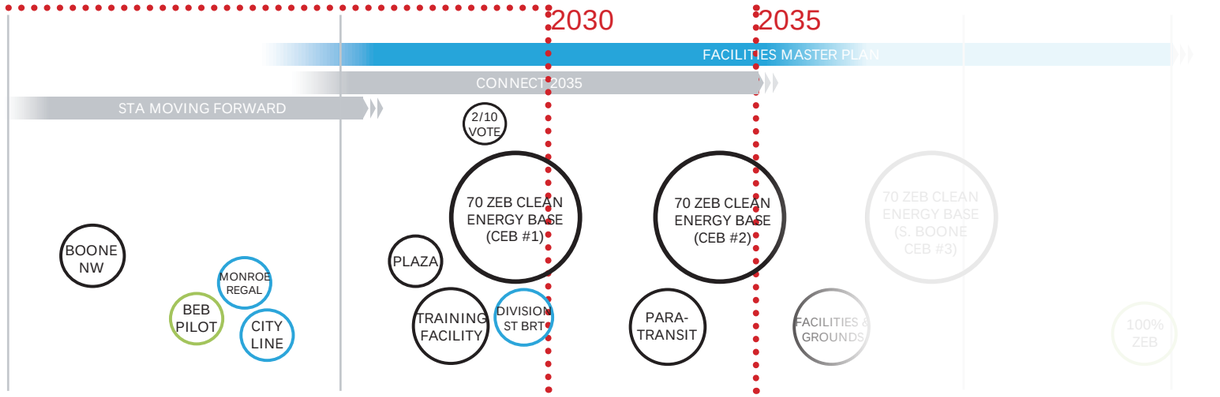



## THE SECOND PHASE (2030-2035) CLEAN ENERGY BASE | PARATRANSIT

In the second phase of the master plan, a new home for an additional 70 ZEBs is constructed. In scenarios 1 and 2, this second clean energy base is envisioned being located at Mission and Greene since the North Spokane Corridor will be completed by this time and STA will have acquired the adjacent WSDOT property to create an 11.5 acre site. In scenario 3, the new home for an additional 70 ZEBs is created by expanding the initial clean energy base, essentially doubling the capacity to 140 with associated maintenance, shared, and support space.

With a new capacity to store, charge and maintain 140 ZEBs, the Boone NW Garage becomes available for repurposing. It is envisioned that Paratransit can move its operations from North Boone and 1212 Sharp to the NW Garage paired with newly constructed or renovated administrative space on the Boone campus. Administrative space will become available for renovation once some departmental functions get relocated to the Plaza and new clean energy base(s) in the initial phase.

The demolition of 1212 Sharp and potential expansion of the Boone campus should also occur in this phase.

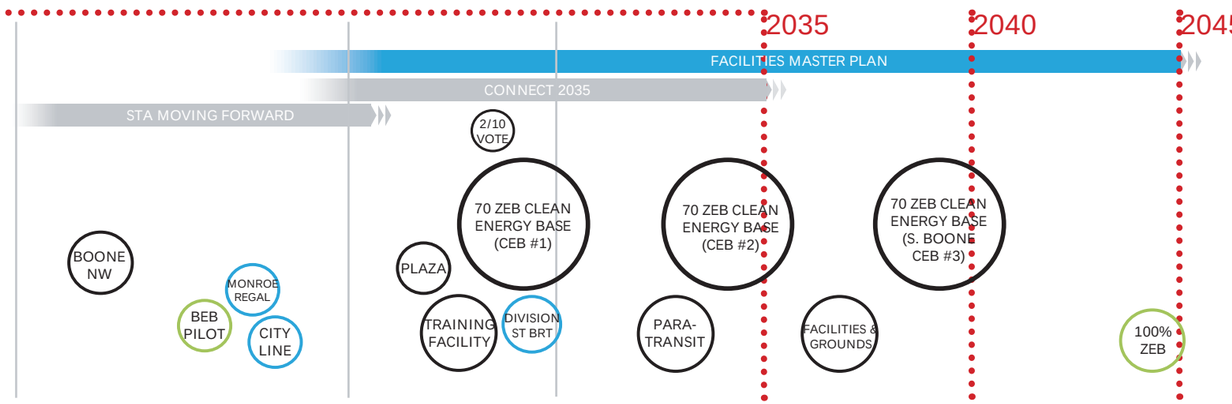



## THE THIRD PHASE (2035-2045) BOONE CLEAN ENERGY BASE | FACILITIES & GROUNDS

The third phase of the master plan focuses on the renovation of the Boone campus to a clean energy facility. With diesel buses nearly completely phased out by this phase, South Boone will be renovated to store and charge an additional 70 ZEBs, bringing the total ZEB storage capacity up to 210. New maintenance facilities for both Fixed Route and Paratransit are envisioned to be constructed on the Boone campus during this phase. The demolition of 1212 Sharp and the expansion of the campus onto the 1300 block will provide space for these new facilities.

With Paratransit relocated, North Boone will then become available for renovation into a home for Facilities and Grounds, giving them a permanent centrally located building to house their workshops and vehicle storage. A laydown yard could also be located outside of the building.

By the end of this phase, STA will have the needed storage and charging capacity at a network of facilities to both accommodate foreseeable growth and complete the transition to a 100% zero-emission fleet.



# 5.0 SITE ANALYSIS

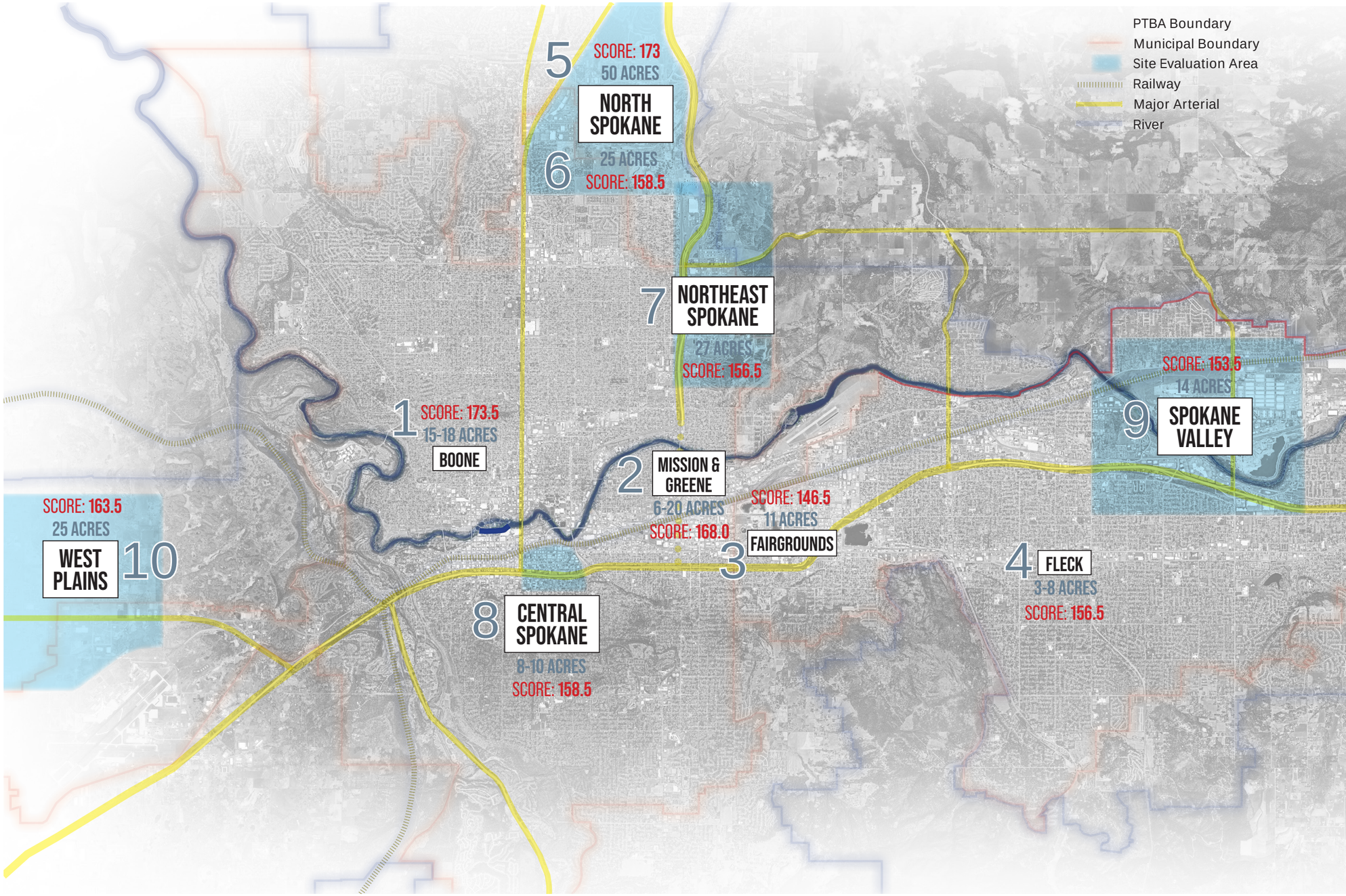
# 5.0 SITE ANALYSIS

## Prospective Areas for Expansion

Evaluation of all future operations models has made it clear that additional property will need to be purchased by STA. In the preferred approach, properties ranging from 10-30 acres are required to supplement existing assets and provide enough area to build the required square footage that will adequately fulfill organizational needs. One of the first steps in the execution of this Plan is to acquire property that allows for the initial phase of expansion: the creation of a new training facility and clean energy base.

Undeveloped sites in the 10-30 acre size range are not readily available in the city, especially centrally located. The following scoring matrices evaluate several areas of town where large undeveloped sites are located to determine which areas are better suited for STA expansion than others. In addition to the acquisition of new property, existing STA-owned properties are also evaluated for expansion.

Based on undeveloped parcel area, discussions with STA, and initial pull-in and pull-out simulations at Boone and Fleck aimed at reducing dead head distances, five areas of town have been identified as potential candidates for expansion: Central Spokane, West Plains, North Spokane, Northeast Spokane and Spokane Valley. In general, sites over 20 acres are only available in North or Northeast Spokane and the West Plains, while smaller sites can be found in Central Spokane and Spokane Valley.








ALSC ARCHITECTS | COFFMAN ENGINEERS

# 5.1 SITE SCORING OVERVIEW

The following categories and criteria will be applied to evaluate ten prospective sites, as shown in the blank scorecard on the right. Until specific sites are identified, evaluation will be done for the characteristics of the areas in consideration. Refinement of nearly all categories will be needed once specific parcels are selected for review in Phase II.

A) UTILITIES

Review of the area's general access to electric infrastructure, sanitary sewer lines, water and gas service, as well as any foreseeable implications for introducing hydrogen-fueling infrastructure.

B) SITE CONDITIONS

High level evaluation for soils type in the area, any relevant terrain in an area - this will be dialed in as specific sites with their own individual terrain are selected. Proximity to any sites with FEMA or Wetlands designations or restrictions.

C) EASE OF ACQUISITION

Evaluation of steps for acquisition and preparation of property for development of a Clean Energy Base.

D) SAFETY STANDARDS

Review of the likelihood of an area's impact to safety standards for visibility and collision control at driveways and nearby intersections, as well as ability for bus queuing.

E) RENEWABLE ENERGY OPPORTUNITIES

Onsite renewable energy collection will be employed throughout the new Clean Energy Base. It is likely that solar energy will be utilized, but wind and geothermal are being evaluated as well.

F) EMPLOYEE SATISFACTION

Characteristics of a site that could contribute to a more enriching environment for employees are considered, such as walkability, ease of access to nearby amenities and proximity to transit stops.

G) OTHER CONSIDERATIONS

Evaluation of the sites ability to be flexible and allow for expansion and growth as operations needs evolve, considering location relative to STA fixed-route and Paratransit system boundaries.

H) TRANSPORTATION & PLANNING

High level evaluation of existing transportation conditions and urban planning considerations related to potential opportunities and impacts. Consideration for adjacent land uses, nearby neighborhood uses, development and transit goals, traffic operations, safety and cost of mitigations.

I) EPF / TITLE VI FEASIBILITY

The characteristics considered in both the Essential Public Facilities (EPF) and Title VI evaluations have been given an initial assessment for likely scoring in the areas identified as a preliminary due diligence. More specific evaluation will be required in Phase II of the Facilities Master Plan. More information on the EPF and Title VI criteria and process follows in the next sections.

**PROPERTY** XX — April 2025

| | |
|---|---|
| GENERAL LOCATION: | SIZE: |
| LOCATION DESCRIPTION: | |

| CRITERIA | VALUE | RANK | SCORE | NOTES |
|---|---|---|---|---|
| **A) UTILITIES** | | | | |
| ELECTRIC | HIGH | | | |
| SEWER | HIGH | | | |
| WATER | HIGH | | | |
| GAS | LOW | | | |
| HYDROGEN | MEDIUM | | | |
| **B) SITE CONDITIONS** | | | | |
| EXISTING SOILS | MEDIUM | | | |
| EXISTING TERRAIN | LOW | | | |
| FEMA / WETLANDS | LOW | | | |
| **C) EASE OF ACQUISITION** | | | | |
| EXISTING OWNERSHIP TYPE: | | | | |
| ACQUISITION TYPE | | | | |
| AGGREGATION NEEDS | | | | |
| ENVIRONMENTAL CLEANUP | | | | |
| SHOVEL READY | | | | |
| **D) SAFETY STANDARDS** | | | | |
| FUEL TYPE FLEXIBILITY | | | | |
| FUEL ACCESS | | | | |
| VISIBILITY / COLLISION CONTROL | | | | |
| QUEUING ABILITY | | | | |
| **E) RENEWABLE ENERGY OPPORTUNITIES** | | | | |
| WIND | LOW | | | |
| GEOTHERMAL | LOW | | | |
| SOLAR | MEDIUM | | | |
| **F) EMPLOYEE SATISFACTION** | | | | |
| WALKABILITY | | | | |
| ACCESS TO AMENITIES | | | | |
| ACCESS TO BUS ROUTES | | | | |
| **G) OTHER CONSIDERATIONS** | | | | |
| COMPATIBLE W/ 2050 BUILD OUT | | | | |
| PARATRANSIT BOUNDARY IMPACT | | | | |
| FUTURE FLEXIBILITY / EXPANSION CAPACITY | | | | |
| **H) TRANSPORTATION & PLANNING** | | | | |
| COMMUNITY/NEIGHBORHOOD IMPACT | HIGH | | | |
| SUPPORTS TOD OPPORTUNITIES | | | | |
| PROXIMITY TO RAIL/DELAY IMPACTS | MEDIUM | | | |
| PROXIMITY TO TRAFFIC CONGESTION | HIGH | | | |
| ACCESS TO MAJOR STREETS | MEDIUM | | | |
| HISTORIC CRASH DATA REVIEW | LOW | | | |
| **I) EPF/TITLE VI FEASIBLITY** | | | | |
| PUBLIC SAFETY/EMERGENCY RESPONSE | LOW | | | |
| SUPPORT SERVICES | LOW | | | |
| ENVIRONMENTAL IMPACT POTENTIAL | MEDIUM | | | |
| DISTRIBUTION OF EPFS | LOW | | | |
| COMPATIBALE LAND USE DESIGNATION | MEDIUM | | | |
| ECONOMIC IMPACT | LOW | | | |
| AESTHETIC IMPACT | LOW | | | |
| ABILITY TO MITIGATE IMPACTS | MEDIUM | | | |
| DISPLACEMENT OF RESIDENTS | MEDIUM | | | |
| DEMOGRAPHIC CHARATERISTICS | MEDIUM | | | |
| PUBLIC PERCEPTION | | | | |

# 5.2 TITLE VI CRITERIA

STA is committed to ensuring that no person is excluded from participation, or denied the benefits of its service on the bases of race, color, or national origin, according to the Title VI of the Civil Rights Act.

According to Title 49 CFR Section 21.9(b)(3), "In determining the site or location of facilities, a recipient or applicant may not make selections with the purpose or effect of excluding persons from, denying them the benefits of, or subjecting them to discrimination under any program to which this regulation applies, on the grounds of race, color, or national origin; or with the purpose or effect of defeating or substantially impairing the accomplishment of the objectives of the Act or this part." In addition, 49 CFR part 21, Appendix C, Section (3)(iv) states, "The location of projects requiring land acquisition and the displacement of persons from their residences and businesses may not be determined on the basis of race, color, or national origin." STA is required to conduct a Title VI equity analysis to ensure neither of the possible site alternatives will cause a disparate impact in areas with a high minority population. Per guidance in FTA C 4702.1B, the analysis must:

> Include outreach to persons potentially impacted by the siting of the facility

> Compare impacts of various siting alternatives

> Determine if cumulative adverse impacts might result, due to the presence of other facilities with similar impacts in the area

> Occur before the selection of the preferred site.

Executive Order 12898 (1994), includes provisions to analyze and mitigate impacts that may cause a disproportionate burden to both minority and low income populations. According to FTA C 4702.1B, the objective of EO 12898 is to ensure that the Federal agencies promote and enforce nondiscrimination as one way of achieving the overarching objective of environmental justice - fair distribution of the adverse impacts of, or burdens associated with, Federal programs, policies, and activities.

In keeping with the intent of environmental justice, STA weighs the cumulative and project-specific impacts to low-income populations, just as it is required to do for minority populations.

The following items have been considered for this early site area evaluation, and will be further refined during Phase II of the Facilities Master Plan.

> Public Safety: The location's access to law enforcement, fire protection and other public safety or emergency response services. Also includes other aspects of public safety and public health, like spill containment, reduction of crime opportunity, proximity to particularly sensitive receptors or electromagnetic force impacts.

> Availability of Support Services: The location's access to necessary support services, like airports, prisons, medical facilities, public transit, utilities, libraries or schools.

> Environmental Impact: The overall assessment, SEPA-style, of the project's impacts to earth, air, water, traffic, noise, light, aesthetics or other categories of environmental evaluation.

> Distribution Equity: The relative saturation of Essential Public Facilities in proximity to the proposed location.

> Land Use Designation: Each jurisdiction's comprehensive plan land use designations for the potential sites and surrounding areas.

> Economic Impact: The location's susceptibility to negative economic impact (or positive economic impact) as a result of the project.

> Aesthetic Impact: The location's visual sensitivity to the type of project the EPF represents.

> Mitigatability: The project's ability to offer compensation (financial or other incentives, provision of amenities, etc.) or design modifications to mitigate the location's specific concerns.





# 5.3 EPF REGIONAL SITING PROCESS

### Washington State Code: Siting of Essential Public Facilities

RCW (Revised Code of Washington) 36.70A.040 requires the comprehensive plan of each county and city to include a process for identifying and siting essential public facilities. Essential public facilities designated in the requirements include regional transit authority facilities as defined in RCW 81.112.020. Each county and city shall, not later than September 1, 2002, establish a process, or amend its existing process, for identifying and siting essential public facilities and adopt or amend its development regulations as necessary to provide for the siting of secure community transition facilities consistent with statutory requirements applicable to these facilities. The office of financial management shall maintain a list of those essential state public facilities that are required or likely to be built within the next six years. The office of financial management may at any time add facilities to the list.

### Spokane County Regional Siting Process for Essential Public Facilities

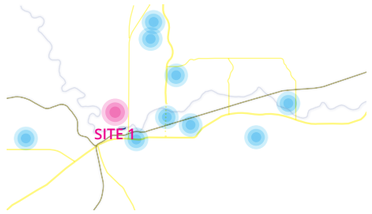
Washington State Legislature enacted laws requiring counties and cities fully planning under GMA to include a process in their Comprehensive Plans to provide for the siting of essential public facilities. In 2001, planning staff from all jurisdictions in Spokane County formed a task force to cooperatively develop a regional siting process for all essential public facilities. The Essential Public Facilities Task Force developed a regional siting process for essential public facilities titled Spokane County Regional Siting Process for Essential Public Facilities.
The regional process provides for a review process with a location analysis. Public involvement takes place throughout the process with public comment periods as well as public hearings. The review process requires the applicant for an EPF to assume responsibility for the bulk of the analysis and processing of the proposal. The analysis includes two parts. First, an analysis of functional criteria of all potential sites is conducted to select the highest-ranking ten (10) semi-finalist sites. Second, these ten semi-finalist sites are analyzed using more qualitative criteria and resulting in selection of at least three preferred sites. Both analyses include public comment periods. Next, the Board of County Commissioners (BoCC) conducts a public hearing on the Site List to allow for further public comment, identify strategies to address any issues associated with particular sites, and rank the finalist sites. The BoCC ranking is advisory to but not binding on the applicant. Last, the applicant, after selecting a specific site, will work directly with local jurisdictions and their regulatory requirements to permit construction and operation of the EPF. Key elements of the siting process are outlined below:

> **EPF's Level of Significance - Siting Process Determination**
> Public Involvement
> **Review Process - Define Roles & Responsibilities**
> Location Analysis
- Equitable Distribution
- Criteria for Assessment
- Functional Analysis - factors such as public safety, availability of support services, environmental impact, distribution equity, and land use designation.
- Qualitative Analysis - factors such as economic impact, aesthetic impact, and the extent to which the site's impacts might be mitigated.
- Scoring Matrix: Weighted analysis

> Preferred Site Review
- Public Hearing
- Urban Impact
- Site Development Criteria
- Cost Sharing

> Local Siting Process
- Local jurisdiction regulatory coordination
- Permit construction and operation of EPF

# 5.4.1 EVALUATION OF PROSPECTIVE SITE 1




CENTRAL SPOKANE - DOWNTOWN:

The properties evaluated for Central Spokane - Downtown are the existing six STA-owned parcels making up the current Boone Campus, which is 15 acres in area. There also is a possibility to consider adjacent property acquisition nearby, which would provide up to 3 additional acres.

**PROPERTY 01** April 2025

*Value: Priority of criteria is of LOW (1.0), MEDIUM(1.5), or HIGH (2.0)*
*Rank: Ranking from 1 (LEAST EFFECTIVE) to 5 (MOST EFFECTIVE)*

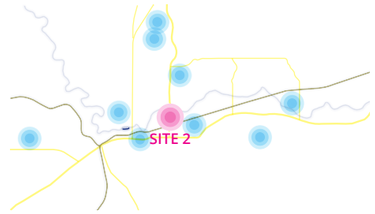
| | | | |
|---|---|---|---|
| GENERAL LOCATION: | **Central Spokane / Downtown** | SIZE: | 15 acres (possibility to acquire 3 acres); 18 acres possible |
| LOCATION DESCRIPTION: | Existing STA-owned parcels (6) making up the current Boone Campus, plus the possibility to consider adjacent property acquisition (4 parcels on north side of Boone, between Cedar and Adams and 2 parcels on south side of Boone, between Cedar and Adams, consideration to vacate Adams and Sharp). | | |

| CRITERIA | VALUE | RANK | SCORE | NOTES |
|---|---|---|---|---|
| **A) UTILITIES** | | | | |
| ELECTRIC | HIGH | 3 | **6** | Limited capacity |
| SEWER | HIGH | 5 | **10** | Adjacent to site |
| WATER | HIGH | 5 | **10** | Adjacent to site |
| GAS | LOW | 5 | **5** | Adjacent to site |
| HYDROGEN | MEDIUM | 2 | **3** | Space constraints |
| **B) SITE CONDITIONS** | | | | |
| EXISTING SOILS | MEDIUM | 1 | **1.5** | Basalt Rock |
| EXISTING TERRAIN | LOW | 4 | **4** | Possible drainage challenges |
| FEMA / WETLANDS | LOW | 5 | **5** | No Wet Lands / FEMA Zone |
| **C) EASE OF ACQUISITION** | | | | |
| EXISTING OWNERSHIP TYPE: | MEDIUM | 5 | **7.5** | *STA-Owned* |
| ACQUISITION TYPE | MEDIUM | 5 | **7.5** | *No acquisition required* |
| AGGREGATION NEEDS | LOW | 5 | **5** | *None needed* |
| ENVIRONMENTAL CLEANUP | HIGH | 3 | **6** | *Some remediation may be needed* |
| SHOVEL READY | HIGH | 1 | **2** | *Demolition required for new construction* |
| **D) SAFETY STANDARDS** | | | | |
| FUEL ACCESS | HIGH | | | *TBD in Phase II* |
| VISIBILITY / COLLISION CONTROL | HIGH | | | *TBD in Phase II* |
| QUEUING ABILITY | HIGH | | | *TBD in Phase II* |
| **E) RENEWABLE ENERGY OPPORTUNITIES** | | | | |
| WIND | LOW | | | *TBD in Phase II* |
| GEOTHERMAL | LOW | | | *TBD in Phase II* |
| SOLAR | MEDIUM | 5 | **7.5** | Sun exposure is equivalent across Spokane |
| **F) EMPLOYEE SATISFACTION** | | | | |
| WALKABILITY | LOW | 4 | **4** | |
| ACCESS TO AMENITIES | LOW | 4 | **4** | |
| ACCESS TO BUS ROUTES | LOW | 5 | **5** | |
| **G) OTHER CONSIDERATIONS** | | | | |
| COMPATIBLE W/ 2050 BUILD OUT | HIGH | 1 | **2** | |
| PARATRANSIT BOUNDARY IMPACT | LOW | 5 | **5** | |
| FUTURE FLEXIBILITY / EXPANSION CAPACITY | HIGH | 3 | **6** | |
| **H) TRANSPORTATION & PLANNING** | | | | |
| COMMUNITY/NEIGHBORHOOD IMPACT | HIGH | 2 | **4** | some nearby houses |
| SUPPORTS TOD OPPORTUNITIES | LOW | | | *TBD in Phase II* |
| PROXIMITY TO RAIL/DELAY IMPACTS | MEDIUM | 5 | **7.5** | nearby RR grade separated |
| PROXIMITY TO TRAFFIC CONGESTION | HIGH | 2 | **4** | congestion, near downtown |
| ACCESS TO MAJOR STREETS | MEDIUM | 5 | **7.5** | frontage on Boone |
| HISTORIC CRASH DATA REVIEW | LOW | 2 | **2** | above average crashes |
| **I) EPF/TITLE VI FEASIBLITY** | | | | |
| PUBLIC SAFETY/EMERGENCY RESPONSE | LOW | 4 | **4** | |
| SUPPORT SERVICES | LOW | 4 | **4** | |
| ENVIRONMENTAL IMPACT POTENTIAL | MEDIUM | 2 | **3** | |
| DISTRIBUTION OF EPFS | LOW | 1 | **1** | |
| COMPATIBALE LAND USE DESIGNATION | MEDIUM | 4 | **6** | current STA use, commercial and residential area |
| ECONOMIC IMPACT | LOW | 4 | **4** | |
| AESTHETIC IMPACT | LOW | 4 | **4** | |
| ABILITY TO MITIGATE IMPACTS | MEDIUM | 4 | **6** | |
| DISPLACEMENT OF RESIDENTS | MEDIUM | 4 | **6** | some nearby houses |
| DEMOGRAPHIC CHARATERISTICS | MEDIUM | 3 | **4.5** | |
| PUBLIC PERCEPTION | LOW | | | *TBD in Phase II* |
| **SCORE** *(300 Possible)* | | | **173.5** | |

Current site score: **173.5**



# 5.4.2 EVALUATION OF PROSPECTIVE SITE 2




CENTRAL SPOKANE - FREYA:

The properties evaluated for Central Spokane - Freya are the existing two STA-owned parcels near the Spokane Community College Campus at the intersection of Mission and Greene, which total roughly 6 acres. Upon completion of the North Spokane Corridor (expected 2030), STA will acquire 5.5 acres in additional parcels from WSDOT, for a total of 11.5 acres at this prospective site.

**PROPERTY 02** April 2025

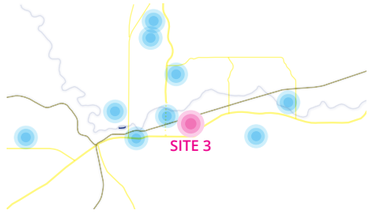
*Value: Priority of criteria is of LOW (1.0), MEDIUM(1.5), or HIGH (2.0)*
*Rank: Ranking from 1 (LEAST EFFECTIVE) to 5 (MOST EFFECTIVE)*

| | | | |
|---|---|---|---|
| GENERAL LOCATION: | **Central Spokane / Freya** | SIZE: | 11.5 acres (6 currently held, 5.5 to be acquired) |
| LOCATION DESCRIPTION: | Existing STA-owned parcels (2) at Mission & Greene and the adjacent parcels that will be acquired from WSDOT in 2030 upon completion of the N/S Freeway. | | |

| CRITERIA | VALUE | RANK | SCORE | NOTES |
|---|---|---|---|---|
| **A) UTILITIES** | | | | |
| ELECTRIC | HIGH | 5 | **10** | Close to Utility Corridor |
| SEWER | HIGH | 5 | **10** | Adjacent to site |
| WATER | HIGH | 5 | **10** | Adjacent to site |
| GAS | LOW | 5 | **10** | Adjacent to site |
| HYDROGEN | MEDIUM | 2 | **3** | Space constraints |
| **B) SITE CONDITIONS** | | | | |
| EXISTING SOILS | MEDIUM | 5 | **7.5** | Gravel / Sand |
| EXISTING TERRAIN | LOW | 5 | **5** | |
| FEMA / WETLANDS | LOW | 5 | **5** | No Wet Lands / FEMA Zone |
| **C) EASE OF ACQUISITION** | | | | |
| EXISTING OWNERSHIP TYPE: | MEDIUM | | | *TBD in Phase II* |
| ACQUISITION TYPE | MEDIUM | | | *TBD in Phase II* |
| AGGREGATION NEEDS | LOW | | | *TBD in Phase II* |
| ENVIRONMENTAL CLEANUP | HIGH | | | *TBD in Phase II* |
| SHOVEL READY | HIGH | | | *TBD in Phase II* |
| **D) SAFETY STANDARDS** | | | | |
| FUEL ACCESS | HIGH | | | *TBD in Phase II* |
| VISIBILITY / COLLISION CONTROL | HIGH | | | *TBD in Phase II* |
| QUEUING ABILITY | HIGH | | | *TBD in Phase II* |
| **E) RENEWABLE ENERGY OPPORTUNITIES** | | | | |
| WIND | LOW | | | *TBD in Phase II* |
| GEOTHERMAL | LOW | | | *TBD in Phase II* |
| SOLAR | MEDIUM | 5 | **7.5** | Sun exposure is equivalent across Spokane |
| **F) EMPLOYEE SATISFACTION** | | | | |
| WALKABILITY | LOW | 3 | **3** | |
| ACCESS TO AMENITIES | LOW | 3 | **3** | |
| ACCESS TO BUS ROUTES | LOW | 5 | **5** | |
| **G) OTHER CONSIDERATIONS** | | | | |
| COMPATIBLE W/ 2050 BUILD OUT | HIGH | 1 | **6** | |
| PARATRANSIT BOUNDARY IMPACT | LOW | 4 | **4** | |
| FUTURE FLEXIBILITY / EXPANSION CAPACITY | HIGH | 4 | **8** | |
| **H) TRANSPORTATION & PLANNING** | | | | |
| COMMUNITY/NEIGHBORHOOD IMPACT | HIGH | 5 | **10** | no nearby neighborhood |
| SUPPORTS TOD OPPORTUNITIES | LOW | | | *TBD in Phase II* |
| PROXIMITY TO RAIL/DELAY IMPACTS | MEDIUM | 1 | **1.5** | RR at grade on Mission |
| PROXIMITY TO TRAFFIC CONGESTION | HIGH | 3 | **6** | moderate congestion |
| ACCESS TO MAJOR STREETS | MEDIUM | 5 | **7.5** | frontage on Mission Ave |
| HISTORIC CRASH DATA REVIEW | LOW | 2 | **2** | above average crashes |
| **I) EPF/TITLE VI FEASIBLITY** | | | | |
| PUBLIC SAFETY/EMERGENCY RESPONSE | LOW | 4 | **4** | |
| SUPPORT SERVICES | LOW | 4 | **4** | |
| ENVIRONMENTAL IMPACT POTENTIAL | MEDIUM | 2 | **3** | |
| DISTRIBUTION OF EPFS | LOW | 1 | **1** | |
| COMPATIBALE LAND USE DESIGNATION | MEDIUM | 4 | **6** | commercial/industrial area |
| ECONOMIC IMPACT | LOW | 4 | **4** | |
| AESTHETIC IMPACT | LOW | 4 | **4** | |
| ABILITY TO MITIGATE IMPACTS | MEDIUM | 4 | **6** | |
| DISPLACEMENT OF RESIDENTS | MEDIUM | 5 | **7.5** | no housing |
| DEMOGRAPHIC CHARATERISTICS | MEDIUM | 3 | **4.5** | |
| PUBLIC PERCEPTION | LOW | | | *TBD in Phase II* |
| **SCORE** *(300 Possible)* | | | **168** | |

Current site score: **168**

# 5.4.3 EVALUATION OF PROSPECTIVE SITE 3




CENTRAL SPOKANE - HAVANA:

The property evaluated for Central Spokane - Havana is the existing STA-owned parcel adjacent the Spokane County Fairgrounds, which is 11 acres in area. There are no permanent structures on the site, which is paved and currently used as a driver's training course.

**PROPERTY 03** April 2025

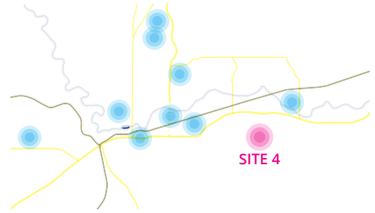
*Value: Priority of criteria is of LOW (1.0), MEDIUM(1.5), or HIGH (2.0)*
*Rank: Ranking from 1 (LEAST EFFECTIVE) to 5 (MOST EFFECTIVE)*

| GENERAL LOCATION: | Central Spokane - Havana | SIZE: | 11 acres |
|---|---|---|---|
| LOCATION DESCRIPTION: | Existing STA-owned parcel at the Spokane County Fairgrounds | | |

| CRITERIA | VALUE | RANK | SCORE | NOTES |
|---|---|---|---|---|
| **A) UTILITIES** | | | | |
| ELECTRIC | HIGH | 5 | 10 | Close to Utility Corridor |
| SEWER | HIGH | 5 | 10 | Adjacent to site |
| WATER | HIGH | 1 | 2 | Approx 1200 ft away |
| GAS | LOW | 5 | 5 | Adjacent to site |
| HYDROGEN | MEDIUM | 2 | 3 | Space constraints |
| **B) SITE CONDITIONS** | | | | |
| EXISTING SOILS | MEDIUM | 5 | 7.5 | Gravel |
| EXISTING TERRAIN | LOW | 4 | 4 | Flat / Potential Drainage Issues |
| FEMA / WETLANDS | LOW | 5 | 5 | No Wet Lands / FEMA Zone |
| **C) EASE OF ACQUISITION** | | | | |
| EXISTING OWNERSHIP TYPE: | MEDIUM | | | *TBD in Phase II* |
| ACQUISITION TYPE | MEDIUM | | | *TBD in Phase II* |
| AGGREGATION NEEDS | LOW | | | *TBD in Phase II* |
| ENVIRONMENTAL CLEANUP | HIGH | | | *TBD in Phase II* |
| SHOVEL READY | HIGH | | | *TBD in Phase II* |
| **D) SAFETY STANDARDS** | | | | |
| FUEL ACCESS | HIGH | | | *TBD in Phase II* |
| VISIBILITY / COLLISION CONTROL | HIGH | | | *TBD in Phase II* |
| QUEUING ABILITY | HIGH | | | *TBD in Phase II* |
| **E) RENEWABLE ENERGY OPPORTUNITIES** | | | | |
| WIND | LOW | | | *TBD in Phase II* |
| GEOTHERMAL | LOW | | | *TBD in Phase II* |
| SOLAR | MEDIUM | 5 | 7.5 | Sun exposure is equivalent across Spokane |
| **F) EMPLOYEE SATISFACTION** | | | | |
| WALKABILITY | LOW | 3 | 3 | |
| ACCESS TO AMENITIES | LOW | 2 | 2 | |
| ACCESS TO BUS ROUTES | LOW | 4 | 4 | |
| **G) OTHER CONSIDERATIONS** | | | | |
| COMPATIBLE W/ 2050 BUILD OUT | HIGH | 1 | 2 | |
| PARATRANSIT BOUNDARY IMPACT | LOW | 3 | 3 | |
| FUTURE FLEXIBILITY / EXPANSION CAPACITY | HIGH | 1 | 2 | |
| **H) TRANSPORTATION & PLANNING** | | | | |
| COMMUNITY/NEIGHBORHOOD IMPACT | HIGH | 5 | 10 | no nearby neighborhood |
| SUPPORTS TOD OPPORTUNITIES | LOW | | | *TBD in Phase II* |
| PROXIMITY TO RAIL/DELAY IMPACTS | MEDIUM | 1 | 1.5 | adjacent to rail, RR at grade on Havana St |
| PROXIMITY TO TRAFFIC CONGESTION | HIGH | 4 | 8 | low congestion |
| ACCESS TO MAJOR STREETS | MEDIUM | 3 | 4.5 | access through new local streets in industrial area |
| HISTORIC CRASH DATA REVIEW | LOW | 3 | 3 | average crashes |
| **I) EPF/TITLE VI FEASIBLITY** | | | | |
| PUBLIC SAFETY/EMERGENCY RESPONSE | LOW | 4 | 4 | |
| SUPPORT SERVICES | LOW | 4 | 4 | |
| ENVIRONMENTAL IMPACT POTENTIAL | MEDIUM | 2 | 3.5 | |
| DISTRIBUTION OF EPFS | LOW | 1 | 1 | |
| COMPATIBALE LAND USE DESIGNATION | MEDIUM | 4 | 6 | |
| ECONOMIC IMPACT | LOW | 5 | 5 | surrounding area undeveloped |
| AESTHETIC IMPACT | LOW | 5 | 5 | surrounding area undeveloped |
| ABILITY TO MITIGATE IMPACTS | MEDIUM | 4 | 6 | |
| DISPLACEMENT OF RESIDENTS | MEDIUM | 5 | 7.5 | undeveloped |
| DEMOGRAPHIC CHARATERISTICS | MEDIUM | 5 | 7.5 | undeveloped |
| PUBLIC PERCEPTION | LOW | | | *TBD in Phase II* |
| **SCORE** *(300 Possible)* | | | 146.5 | |

Current site score: 146.5

# 5.4.4 EVALUATION OF PROSPECTIVE SITE 4




SPOKANE VALLEY - CENTRAL:

The property evaluated for Spokane Valley - Central is the existing STA-owned parcel that is home to the Fleck Valley Service Center, and totals 3 acres. There also is a possibility to consider adjacent property acquisition nearby, which would provide up to 5 additional acres, for a total of 8 possible acres at this site.

**PROPERTY 04** April 2025

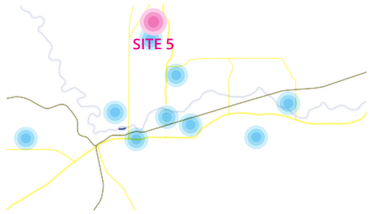
*Value: Priority of criteria is of LOW (1.0), MEDIUM(1.5), or HIGH (2.0)*
*Rank: Ranking from 1 (LEAST EFFECTIVE) to 5 (MOST EFFECTIVE)*

| GENERAL LOCATION: | Spokane Valley | SIZE: | 3 acres (possibility to acquire adjacent 5 acres); 8 acres possible |
|---|---|---|---|
| LOCATION DESCRIPTION: | Existing STA-owned parcel (45211.071) with Fleck facility at Bowdish, plus the possibility to acquire 5 adjacent acres and facilities (45211.0601, 45211.0510, 45211.0511, 45211.0518). | | |

| CRITERIA | VALUE | RANK | SCORE | NOTES |
|---|---|---|---|---|
| **A) UTILITIES** | | | | |
| ELECTRIC | HIGH | 2 | 4 | Not near power hub. |
| SEWER | HIGH | 4 | 8 | In vicinity of the site |
| WATER | HIGH | 4 | 8 | In vicinity of the site |
| GAS | LOW | 4 | 4 | In vicinity of the site |
| HYDROGEN | MEDIUM | 2 | 3 | Space constraints |
| **B) SITE CONDITIONS** | | | | |
| EXISTING SOILS | MEDIUM | 5 | 7.5 | Gravel |
| EXISTING TERRAIN | LOW | 5 | 5 | |
| FEMA / WETLANDS | LOW | 5 | 5 | No Wet Lands / FEMA Zone |
| **C) EASE OF ACQUISITION** | | | | |
| EXISTING OWNERSHIP TYPE: | MEDIUM | | | *TBD in Phase II* |
| ACQUISITION TYPE | MEDIUM | | | *TBD in Phase II* |
| AGGREGATION NEEDS | LOW | | | *TBD in Phase II* |
| ENVIRONMENTAL CLEANUP | HIGH | | | *TBD in Phase II* |
| SHOVEL READY | HIGH | | | *TBD in Phase II* |
| **D) SAFETY STANDARDS** | | | | |
| FUEL ACCESS | HIGH | | | *TBD in Phase II* |
| VISIBILITY / COLLISION CONTROL | HIGH | | | *TBD in Phase II* |
| QUEUING ABILITY | HIGH | | | *TBD in Phase II* |
| **E) RENEWABLE ENERGY OPPORTUNITIES** | | | | |
| WIND | LOW | | | *TBD in Phase II* |
| GEOTHERMAL | LOW | | | *TBD in Phase II* |
| SOLAR | MEDIUM | 5 | 7.5 | Sun exposure is equivalent across Spokane |
| **F) EMPLOYEE SATISFACTION** | | | | |
| WALKABILITY | LOW | 4 | 4 | |
| ACCESS TO AMENITIES | LOW | 4 | 4 | |
| ACCESS TO BUS ROUTES | LOW | 5 | 5 | |
| **G) OTHER CONSIDERATIONS** | | | | |
| COMPATIBLE W/ 2050 BUILD OUT | HIGH | 1 | 2 | |
| PARATRANSIT BOUNDARY IMPACT | LOW | | | *TBD in Phase II* |
| FUTURE FLEXIBILITY / EXPANSION CAPACITY | HIGH | 4 | 8 | |
| **H) TRANSPORTATION & PLANNING** | | | | |
| COMMUNITY/NEIGHBORHOOD IMPACT | HIGH | 5 | 10 | no nearby neighborhood |
| SUPPORTS TOD OPPORTUNITIES | LOW | | | *TBD in Phase II* |
| PROXIMITY TO RAIL/DELAY IMPACTS | MEDIUM | 5 | 7.5 | no nearby RR |
| PROXIMITY TO TRAFFIC CONGESTION | HIGH | 4 | 8 | low congestion |
| ACCESS TO MAJOR STREETS | MEDIUM | 5 | 7.5 | frontage on Bowdish |
| HISTORIC CRASH DATA REVIEW | LOW | 4 | 4 | below average crashes |
| **I) EPF/TITLE VI FEASIBLITY** | | | | |
| PUBLIC SAFETY/EMERGENCY RESPONSE | LOW | 4 | 4 | close to fire station |
| SUPPORT SERVICES | LOW | 4 | 4 | |
| ENVIRONMENTAL IMPACT POTENTIAL | MEDIUM | 2 | 3.5 | |
| DISTRIBUTION OF EPFS | LOW | 1 | 1 | |
| COMPATIBALE LAND USE DESIGNATION | MEDIUM | 4 | 6 | commercial/industrial |
| ECONOMIC IMPACT | LOW | 4 | 4 | existing development on site |
| AESTHETIC IMPACT | LOW | 4 | 4 | existing development on site |
| ABILITY TO MITIGATE IMPACTS | MEDIUM | 4 | 6 | |
| DISPLACEMENT OF RESIDENTS | MEDIUM | 5 | 7.5 | no housing |
| DEMOGRAPHIC CHARATERISTICS | MEDIUM | 3 | 4.5 | |
| PUBLIC PERCEPTION | LOW | | | *TBD in Phase II* |
| **SCORE** *(300 Possible)* | | | 156.5 | |

Current site score: 156.5

# 5.4.5 EVALUATION OF PROSPECTIVE SITE 5




NORTH SPOKANE - 50 ACRES:

The evaluation for North Spokane - 50 acres is currently a yet-to-be-determined 50 acre property within the area bound by Highway 2 (west), North Spokane Corridor (east) and Lincoln Rd (south). The area is zoned primarily Industrial (Light and Heavy).

**PROPERTY 05** April 2025

*Value: Priority of criteria is of LOW (1.0), MEDIUM(1.5), or HIGH (2.0)*
*Rank: Ranking from 1 (LEAST EFFECTIVE) to 5 (MOST EFFECTIVE)*

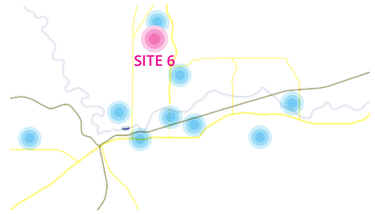
| GENERAL LOCATION: | North Spokane | SIZE: | 48 acres |
|---|---|---|---|
| LOCATION DESCRIPTION: | North Spokane between Highway 2 and Highway 395, North of Lincoln Rd. | | |

| CRITERIA | VALUE | RANK | SCORE | NOTES |
|---|---|---|---|---|
| **A) UTILITIES** | | | | |
| ELECTRIC | HIGH | 5 | 10 | Close to Utility Corridor |
| SEWER | HIGH | 5 | 10 | Adjacent to site |
| WATER | HIGH | 5 | 10 | Adjacent to site |
| GAS | LOW | 4 | 4 | In vicinity of the site |
| HYDROGEN | MEDIUM | 4 | 6 | Ample space, largest lot size |
| **B) SITE CONDITIONS** | | | | |
| EXISTING SOILS | MEDIUM | 4 | 6 | Clay / Sand |
| EXISTING TERRAIN | LOW | 3 | 3 | Steep slopes |
| FEMA / WETLANDS | LOW | 5 | 5 | No Wet Lands / FEMA Zone |
| **C) EASE OF ACQUISITION** | | | | |
| EXISTING OWNERSHIP TYPE | MEDIUM | | | *TBD in Phase II* |
| ACQUISITION TYPE | MEDIUM | | | *TBD in Phase II* |
| AGGREGATION NEEDS | LOW | | | *TBD in Phase II* |
| ENVIRONMENTAL CLEANUP | HIGH | | | *TBD in Phase II* |
| SHOVEL READY | HIGH | | | *TBD in Phase II* |
| **D) SAFETY STANDARDS** | | | | |
| FUEL ACCESS | HIGH | | | *TBD in Phase II* |
| VISIBILITY / COLLISION CONTROL | HIGH | | | *TBD in Phase II* |
| QUEUING ABILITY | HIGH | | | *TBD in Phase II* |
| **E) RENEWABLE ENERGY OPPORTUNITIES** | | | | |
| WIND | LOW | | | *TBD in Phase II* |
| GEOTHERMAL | LOW | | | *TBD in Phase II* |
| SOLAR | MEDIUM | 5 | 7.5 | Sun exposure is equivalent across Spokane. |
| **F) EMPLOYEE SATISFACTION** | | | | |
| WALKABILITY | LOW | 3 | 3 | |
| ACCESS TO AMENITIES | LOW | 2 | 2 | |
| ACCESS TO BUS ROUTES | LOW | 4 | 4 | |
| **G) OTHER CONSIDERATIONS** | | | | |
| COMPATIBLE W/ 2050 BUILD OUT | HIGH | 5 | 10 | |
| PARATRANSIT BOUNDARY IMPACT | LOW | | | *TBD in Phase II* |
| FUTURE FLEXIBILITY / EXPANSION CAPACITY | HIGH | 5 | 10 | |
| **H) TRANSPORTATION & PLANNING** | | | | |
| COMMUNITY/NEIGHBORHOOD IMPACT | HIGH | 4 | 8 | apartments to the north |
| SUPPORTS TOD OPPORTUNITIES | LOW | | | *TBD in Phase II* |
| PROXIMITY TO RAIL/DELAY IMPACTS | MEDIUM | 5 | 7.5 | no nearby RR |
| PROXIMITY TO TRAFFIC CONGESTION | HIGH | 3 | 6 | moderate congestion |
| ACCESS TO MAJOR STREETS | MEDIUM | 5 | 7.5 | frontage on Nevada |
| HISTORIC CRASH DATA REVIEW | LOW | 3 | 3 | average crashes |
| **I) EPF/TITLE VI FEASIBLITY** | | | | |
| PUBLIC SAFETY/EMERGENCY RESPONSE | LOW | 4 | 4 | close to fire station |
| SUPPORT SERVICES | LOW | 4 | 4 | |
| ENVIRONMENTAL IMPACT POTENTIAL | MEDIUM | 3 | 4.5 | vacant land |
| DISTRIBUTION OF EPFS | LOW | 1 | 1 | |
| COMPATIBALE LAND USE DESIGNATION | MEDIUM | 4 | 6 | commercial/industrial, apartments to the north |
| ECONOMIC IMPACT | LOW | 5 | 5 | surrounding area undeveloped |
| AESTHETIC IMPACT | LOW | 5 | 5 | surrounding area undeveloped |
| ABILITY TO MITIGATE IMPACTS | MEDIUM | 4 | 6 | |
| DISPLACEMENT OF RESIDENTS | MEDIUM | 5 | 7.5 | undeveloped |
| DEMOGRAPHIC CHARATERISTICS | MEDIUM | 5 | 7.5 | undeveloped |
| PUBLIC PERCEPTION | LOW | | | *TBD in Phase II* |
| **SCORE** *(300 Possible)* | | | 173 | |

Current site score: 173



# 5.4.6 EVALUATION OF PROSPECTIVE SITE 6




NORTH SPOKANE - 25 ACRES:

The evaluation for North Spokane - 25 acres is currently a yet-to-be-determined 25 acre property within the area bound by Highway 2 (west), North Spokane Corridor (east) and Lincoln Rd (south). The area is zoned primarily Industrial (Light and Heavy).

**PROPERTY 06** April 2025

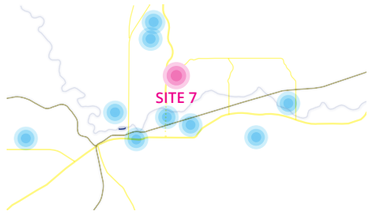
*Value: Priority of criteria is of LOW (1.0), MEDIUM(1.5), or HIGH (2.0)*
*Rank: Ranking from 1 (LEAST EFFECTIVE) to 5 (MOST EFFECTIVE)*

| GENERAL LOCATION: | North Spokane | SIZE: | 26 acres |
|---|---|---|---|
| LOCATION DESCRIPTION: | North Spokane between Highway 2 and Highway 395, North of Lincoln Rd. | | |

| CRITERIA | VALUE | RANK | SCORE | NOTES |
|---|---|---|---|---|
| **A) UTILITIES** | | | | |
| ELECTRIC | HIGH | 4 | 8 | |
| SEWER | HIGH | 1 | 2 | No SS in close proximity. |
| WATER | HIGH | 5 | 10 | In vicinity of the site |
| GAS | LOW | 4 | 4 | In vicinity of the site |
| HYDROGEN | MEDIUM | 3 | 4.5 | Larger lot size |
| **B) SITE CONDITIONS** | | | | |
| EXISTING SOILS | MEDIUM | 1 | 1.5 | Clay / Sand |
| EXISTING TERRAIN | LOW | 3 | 3 | Some steep slopes |
| FEMA / WETLANDS | LOW | 5 | 5 | No Wet Lands / FEMA Zone |
| **C) EASE OF ACQUISITION** | | | | |
| EXISTING OWNERSHIP TYPE: | MEDIUM | | | *TBD in Phase II* |
| ACQUISITION TYPE | MEDIUM | | | *TBD in Phase II* |
| AGGREGATION NEEDS | LOW | | | *TBD in Phase II* |
| ENVIRONMENTAL CLEANUP | HIGH | | | *TBD in Phase II* |
| SHOVEL READY | HIGH | | | *TBD in Phase II* |
| **D) SAFETY STANDARDS** | | | | |
| FUEL ACCESS | HIGH | | | *TBD in Phase II* |
| VISIBILITY / COLLISION CONTROL | HIGH | | | *TBD in Phase II* |
| QUEUING ABILITY | HIGH | | | *TBD in Phase II* |
| **E) RENEWABLE ENERGY OPPORTUNITIES** | | | | |
| WIND | LOW | | | *TBD in Phase II* |
| GEOTHERMAL | LOW | | | *TBD in Phase II* |
| SOLAR | MEDIUM | 5 | 7.5 | Sun exposure is equivalent across Spokane |
| **F) EMPLOYEE SATISFACTION** | | | | |
| WALKABILITY | LOW | 3 | 3 | |
| ACCESS TO AMENITIES | LOW | 2 | 2 | |
| ACCESS TO BUS ROUTES | LOW | 4 | 4 | |
| **G) OTHER CONSIDERATIONS** | | | | |
| COMPATIBLE W/ 2050 BUILD OUT | HIGH | 5 | 10 | |
| PARATRANSIT BOUNDARY IMPACT | LOW | | | *TBD in Phase II* |
| FUTURE FLEXIBILITY / EXPANSION CAPACITY | HIGH | 5 | 10 | |
| **H) TRANSPORTATION & PLANNING** | | | | |
| COMMUNITY/NEIGHBORHOOD IMPACT | HIGH | 5 | 10 | vacant, no adjacent development |
| SUPPORTS TOD OPPORTUNITIES | LOW | | | *TBD in Phase II* |
| PROXIMITY TO RAIL/DELAY IMPACTS | MEDIUM | 5 | 7.5 | no nearby RR |
| PROXIMITY TO TRAFFIC CONGESTION | HIGH | 4 | 8 | low congestion |
| ACCESS TO MAJOR STREETS | MEDIUM | 4 | 6 | frontage on Magnesium |
| HISTORIC CRASH DATA REVIEW | LOW | 3 | 3 | average crashes |
| **I) EPF/TITLE VI FEASIBLITY** | | | | |
| PUBLIC SAFETY/EMERGENCY RESPONSE | LOW | 3 | 3 | |
| SUPPORT SERVICES | LOW | 4 | 4 | |
| ENVIRONMENTAL IMPACT POTENTIAL | MEDIUM | 3 | 4.5 | vacant land |
| DISTRIBUTION OF EPFS | LOW | 1 | 1 | |
| COMPATIBALE LAND USE DESIGNATION | MEDIUM | 4 | 6 | commercial/industrial, apartments to the north |
| ECONOMIC IMPACT | LOW | 5 | 5 | surrounding area undeveloped |
| AESTHETIC IMPACT | LOW | 5 | 5 | surrounding area undeveloped |
| ABILITY TO MITIGATE IMPACTS | MEDIUM | 4 | 6 | |
| DISPLACEMENT OF RESIDENTS | MEDIUM | 5 | 7.5 | undeveloped |
| DEMOGRAPHIC CHARATERISTICS | MEDIUM | 5 | 7.5 | undeveloped |
| PUBLIC PERCEPTION | LOW | | | *TBD in Phase II* |
| **SCORE** *(300 Possible)* | | | 158.5 | |

Current site score: 158.5

# 5.4.7 EVALUATION OF PROSPECTIVE SITE 7




NORTHEAST SPOKANE:

The evaluation for Northeast Spokane is a yet-to-be-determined 25 acre property within the area bound by North Spokane Corridor (west), Beacon Hill / Mount Baldy (east), Lincoln Rd (north), Frederick Ave (south). The area is zoned primarily Industrial (Light and Heavy) with some portions zoned Residential.

**PROPERTY 07** April 2025

*Value: Priority of criteria is of LOW (1.0), MEDIUM(1.5), or HIGH (2.0)*
*Rank: Ranking from 1 (LEAST EFFECTIVE) to 5 (MOST EFFECTIVE)*

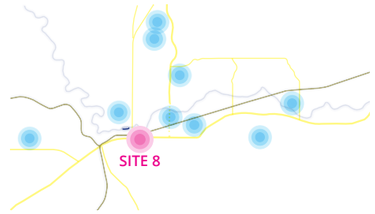
| | | | |
|---|---|---|---|
| GENERAL LOCATION: | Northeast Spokane | SIZE: | 27 acres |
| LOCATION DESCRIPTION: | Vicinity bound by North Spokane Corridor (west), Beacon Hill / Mount Baldy (east), Lincoln Rd (north) and Frederick Ave (south) | | |

| CRITERIA | VALUE | RANK | SCORE | NOTES |
|---|---|---|---|---|
| **A) UTILITIES** | | | | |
| ELECTRIC | HIGH | 5 | 10 | Close to Utility Corridor |
| SEWER | HIGH | 2 | 4 | No SS in vicinity. |
| WATER | HIGH | 2 | 4 | No WA in vicinity. |
| GAS | LOW | 4 | 4 | In vicinity of the site |
| HYDROGEN | MEDIUM | 4 | 6 | Larger lot size |
| **B) SITE CONDITIONS** | | | | |
| EXISTING SOILS | MEDIUM | 1 | 1.5 | Basalt Rock |
| EXISTING TERRAIN | LOW | 4 | 4 | Possible drainage challenges |
| FEMA / WETLANDS | LOW | 5 | 5 | No Wet Lands / FEMA Zone |
| **C) EASE OF ACQUISITION** | | | | |
| EXISTING OWNERSHIP TYPE: | MEDIUM | | | *TBD in Phase II* |
| ACQUISITION TYPE | MEDIUM | | | *TBD in Phase II* |
| AGGREGATION NEEDS | LOW | | | *TBD in Phase II* |
| ENVIRONMENTAL CLEANUP | HIGH | | | *TBD in Phase II* |
| SHOVEL READY | HIGH | | | *TBD in Phase II* |
| **D) SAFETY STANDARDS** | | | | |
| FUEL ACCESS | HIGH | | | *TBD in Phase II* |
| VISIBILITY / COLLISION CONTROL | HIGH | | | *TBD in Phase II* |
| QUEUING ABILITY | HIGH | | | *TBD in Phase II* |
| **E) RENEWABLE ENERGY OPPORTUNITIES** | | | | |
| WIND | LOW | | | *TBD in Phase II* |
| GEOTHERMAL | LOW | | | *TBD in Phase II* |
| SOLAR | MEDIUM | 5 | 7.5 | Sun exposure is equivalent across Spokane |
| **F) EMPLOYEE SATISFACTION** | | | | |
| WALKABILITY | LOW | 3 | 3 | |
| ACCESS TO AMENITIES | LOW | 2 | 2 | |
| ACCESS TO BUS ROUTES | LOW | 2 | 2 | |
| **G) OTHER CONSIDERATIONS** | | | | |
| COMPATIBLE W/ 2050 BUILD OUT | HIGH | 5 | 10 | |
| PARATRANSIT BOUNDARY IMPACT | LOW | | | *TBD in Phase II* |
| FUTURE FLEXIBILITY / EXPANSION CAPACITY | HIGH | 5 | 10 | |
| **H) TRANSPORTATION & PLANNING** | | | | |
| COMMUNITY/NEIGHBORHOOD IMPACT | HIGH | 5 | 10 | no surrounding neighborhood |
| SUPPORTS TOD OPPORTUNITIES | LOW | | | *TBD in Phase II* |
| PROXIMITY TO RAIL/DELAY IMPACTS | MEDIUM | 5 | 7.5 | no nearby RR |
| PROXIMITY TO TRAFFIC CONGESTION | HIGH | 4 | 8 | low congestion |
| ACCESS TO MAJOR STREETS | MEDIUM | 4 | 6 | frontage on Havana, close to Francis |
| HISTORIC CRASH DATA REVIEW | LOW | 4 | 4 | below average crashes |
| **I) EPF/TITLE VI FEASIBLITY** | | | | |
| PUBLIC SAFETY/EMERGENCY RESPONSE | LOW | 3 | 3 | |
| SUPPORT SERVICES | LOW | 4 | 4 | |
| ENVIRONMENTAL IMPACT POTENTIAL | MEDIUM | 2 | 3 | existing development on site |
| DISTRIBUTION OF EPFS | LOW | 1 | 1 | |
| COMPATIBALE LAND USE DESIGNATION | MEDIUM | 4 | 6 | commercial/industrial |
| ECONOMIC IMPACT | LOW | 5 | 5 | surrounding area undeveloped |
| AESTHETIC IMPACT | LOW | 5 | 5 | surrounding area undeveloped |
| ABILITY TO MITIGATE IMPACTS | MEDIUM | 4 | 6 | |
| DISPLACEMENT OF RESIDENTS | MEDIUM | 5 | 7.5 | undeveloped |
| DEMOGRAPHIC CHARATERISTICS | MEDIUM | 5 | 7.5 | undeveloped |
| PUBLIC PERCEPTION | LOW | | | *TBD in Phase II* |
| **SCORE** *(300 Possible)* | | | 156.5 | |

Current site score: 156.5



# 5.4.8 EVALUATION OF PROSPECTIVE SITE 8




CENTRAL SPOKANE - I-90:

The evaluation for Central Spokane - I-90 is a yet-to-be-determined 10 acre property within the area along I-90, between Division (west) and Hamilton (east). The area is zoned primarily General Commercial, with some areas of Downtown and Office.

**PROPERTY 08** April 2025

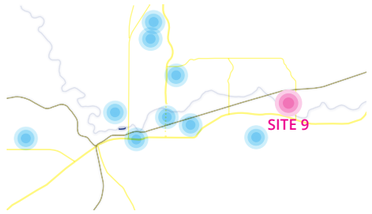
*Value: Priority of criteria is of LOW (1.0), MEDIUM(1.5), or HIGH (2.0)*
*Rank: Ranking from 1 (LEAST EFFECTIVE) to 5 (MOST EFFECTIVE)*

| | | | |
|---|---|---|---|
| GENERAL LOCATION: | Central Spokane - I90 | SIZE: | 10 acres |
| LOCATION DESCRIPTION: | Central Spokane along I90, between Division and Hamilton | | |

| CRITERIA | VALUE | RANK | SCORE | NOTES |
|---|---|---|---|---|
| **A) UTILITIES** | | | | |
| ELECTRIC | HIGH | 3 | 6 | Limited capacity |
| SEWER | HIGH | 5 | 10 | Adjacent to site |
| WATER | HIGH | 5 | 10 | Adjacent to site |
| GAS | LOW | 5 | 5 | Adjacent to site |
| HYDROGEN | MEDIUM | 2 | 3 | Space constraints |
| **B) SITE CONDITIONS** | | | | |
| EXISTING SOILS | MEDIUM | 1 | 1.5 | Rock |
| EXISTING TERRAIN | LOW | 4 | 4 | Some grading challenges |
| FEMA / WETLANDS | LOW | 5 | 5 | No Wet Lands / FEMA Zone |
| **C) EASE OF ACQUISITION** | | | | |
| EXISTING OWNERSHIP TYPE: | MEDIUM | | | *TBD in Phase II* |
| ACQUISITION TYPE | MEDIUM | | | *TBD in Phase II* |
| AGGREGATION NEEDS | LOW | | | *TBD in Phase II* |
| ENVIRONMENTAL CLEANUP | HIGH | | | *TBD in Phase II* |
| SHOVEL READY | HIGH | | | *TBD in Phase II* |
| **D) SAFETY STANDARDS** | | | | |
| FUEL ACCESS | HIGH | | | *TBD in Phase II* |
| VISIBILITY / COLLISION CONTROL | HIGH | | | *TBD in Phase II* |
| QUEUING ABILITY | HIGH | | | *TBD in Phase II* |
| **E) RENEWABLE ENERGY OPPORTUNITIES** | | | | |
| WIND | LOW | | | *TBD in Phase II* |
| GEOTHERMAL | LOW | | | *TBD in Phase II* |
| SOLAR | MEDIUM | 5 | 7.5 | Sun exposure is equivalent across Spokane |
| **F) EMPLOYEE SATISFACTION** | | | | |
| WALKABILITY | LOW | 4 | 4 | |
| ACCESS TO AMENITIES | LOW | 4 | 4 | |
| ACCESS TO BUS ROUTES | LOW | 5 | 5 | |
| **G) OTHER CONSIDERATIONS** | | | | |
| COMPATIBLE W/ 2050 BUILD OUT | HIGH | 3 | 6 | |
| PARATRANSIT BOUNDARY IMPACT | LOW | 5 | 5 | |
| FUTURE FLEXIBILITY / EXPANSION CAPACITY | HIGH | 2 | 4 | |
| **H) TRANSPORTATION & PLANNING** | | | | |
| COMMUNITY/NEIGHBORHOOD IMPACT | HIGH | 5 | 10 | no nearby neighborhood |
| SUPPORTS TOD OPPORTUNITIES | LOW | | | *TBD in Phase II* |
| PROXIMITY TO RAIL/DELAY IMPACTS | MEDIUM | 5 | 7.5 | no nearby RR |
| PROXIMITY TO TRAFFIC CONGESTION | HIGH | 2 | 4 | congestion, near downtown |
| ACCESS TO MAJOR STREETS | MEDIUM | 4 | 6 | frontage on 3rd, one-way |
| HISTORIC CRASH DATA REVIEW | LOW | 3 | 3 | average crashes |
| **I) EPF/TITLE VI FEASIBLITY** | | | | |
| PUBLIC SAFETY/EMERGENCY RESPONSE | LOW | 3 | 3 | |
| SUPPORT SERVICES | LOW | 4 | 4 | |
| ENVIRONMENTAL IMPACT POTENTIAL | MEDIUM | 2 | 3 | existing development on site |
| DISTRIBUTION OF EPFS | LOW | 1 | 1 | |
| COMPATIBALE LAND USE DESIGNATION | MEDIUM | 4 | 6 | commercial/industrial |
| ECONOMIC IMPACT | LOW | 5 | 5 | vacant existing development |
| AESTHETIC IMPACT | LOW | 5 | 5 | vacant existing development |
| ABILITY TO MITIGATE IMPACTS | MEDIUM | 4 | 6 | |
| DISPLACEMENT OF RESIDENTS | MEDIUM | 5 | 7.5 | undeveloped |
| DEMOGRAPHIC CHARATERISTICS | MEDIUM | 5 | 7.5 | undeveloped |
| PUBLIC PERCEPTION | LOW | | | *TBD in Phase II* |
| **SCORE** *(300 Possible)* | | | 158.5 | |

Current site score: 158.5

# 5.4.9 EVALUATION OF PROSPECTIVE SITE 9




SPOKANE VALLEY - EAST:

The evaluation for Spokane Valley - East is a yet-to-be-determined 15 acre property within the area bound by Pines (west), Barker (east), Wellesley (north) and Broadway (south). The area is zoned primarily Industrial with some portions zoned Mixed Use, Residential and Commercial.

**PROPERTY 09** April 2025

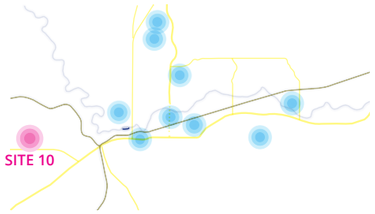
*Value : Priority of criteria is of LOW (1.0), MEDIUM(1.5), or HIGH (2.0)*
*Rank: Ranking from 1 (LEAST EFFECTIVE) to 5 (MOST EFFECTIVE)*

| GENERAL LOCATION: | Spokane Valley | SIZE: | 14 acres |
|---|---|---|---|
| LOCATION DESCRIPTION: | Vicinity bound by Pines (west), Barker (east), Wellesley (north) and Broadway (south) | | |

| CRITERIA | VALUE | RANK | SCORE | NOTES |
|---|---|---|---|---|
| **A) UTILITIES** | | | | |
| ELECTRIC | HIGH | 2 | 4 | Not near power hub. |
| SEWER | HIGH | 2 | 4 | No SS in vicinity. |
| WATER | HIGH | 4 | 8 | In vicinity of the site |
| GAS | LOW | 4 | 4 | In vicinity of the site |
| HYDROGEN | MEDIUM | 3 | 4.5 | Space constraints |
| **B) SITE CONDITIONS** | | | | |
| EXISTING SOILS | MEDIUM | 4 | 6 | Clay/Sand |
| EXISTING TERRAIN | LOW | 4 | 4 | Flat. Potential drainage issues |
| FEMA / WETLANDS | LOW | 5 | 5 | No Wet Lands / FEMA Zone |
| **C) EASE OF ACQUISITION** | | | | |
| EXISTING OWNERSHIP TYPE: | MEDIUM | | | *TBD in Phase II* |
| ACQUISITION TYPE | MEDIUM | | | *TBD in Phase II* |
| AGGREGATION NEEDS | LOW | | | *TBD in Phase II* |
| ENVIRONMENTAL CLEANUP | HIGH | | | *TBD in Phase II* |
| SHOVEL READY | HIGH | | | *TBD in Phase II* |
| **D) SAFETY STANDARDS** | | | | |
| FUEL ACCESS | HIGH | | | *TBD in Phase II* |
| VISIBILITY / COLLISION CONTROL | HIGH | | | *TBD in Phase II* |
| QUEUING ABILITY | HIGH | | | *TBD in Phase II* |
| **E) RENEWABLE ENERGY OPPORTUNITIES** | | | | |
| WIND | LOW | | | *TBD in Phase II* |
| GEOTHERMAL | LOW | | | *TBD in Phase II* |
| SOLAR | MEDIUM | 5 | 7.5 | Sun exposure is equivalent across Spokane |
| **F) EMPLOYEE SATISFACTION** | | | | |
| WALKABILITY | LOW | 2 | 2 | |
| ACCESS TO AMENITIES | LOW | 2 | 2 | |
| ACCESS TO BUS ROUTES | LOW | 3 | 3 | |
| **G) OTHER CONSIDERATIONS** | | | | |
| COMPATIBLE W/ 2050 BUILD OUT | HIGH | 4 | 8 | |
| PARATRANSIT BOUNDARY IMPACT | LOW | | | *TBD in Phase II* |
| FUTURE FLEXIBILITY / EXPANSION CAPACITY | HIGH | 4 | 8 | |
| **H) TRANSPORTATION & PLANNING** | | | | |
| COMMUNITY/NEIGHBORHOOD IMPACT | HIGH | 5 | 10 | no nearby neighborhood |
| SUPPORTS TOD OPPORTUNITIES | LOW | | | *TBD in Phase II* |
| PROXIMITY TO RAIL/DELAY IMPACTS | MEDIUM | 5 | 7.5 | RR grade separated |
| PROXIMITY TO TRAFFIC CONGESTION | HIGH | 4 | 8 | low congestion |
| ACCESS TO MAJOR STREETS | MEDIUM | 3 | 4.5 | access through new local streets in industrial area |
| HISTORIC CRASH DATA REVIEW | LOW | 3 | 3 | average crashes |
| **I) EPF/TITLE VI FEASIBLITY** | | | | |
| PUBLIC SAFETY/EMERGENCY RESPONSE | LOW | 4 | 4 | close to fire station |
| SUPPORT SERVICES | LOW | 4 | 4 | |
| ENVIRONMENTAL IMPACT POTENTIAL | MEDIUM | 3 | 4.5 | vacant land |
| DISTRIBUTION OF EPFS | LOW | 1 | 1 | |
| COMPATIBALE LAND USE DESIGNATION | MEDIUM | 4 | 6 | commercial/industrial |
| ECONOMIC IMPACT | LOW | 5 | 5 | surrounding area undeveloped |
| AESTHETIC IMPACT | LOW | 5 | 5 | surrounding area undeveloped |
| ABILITY TO MITIGATE IMPACTS | MEDIUM | 4 | 6 | |
| DISPLACEMENT OF RESIDENTS | MEDIUM | 5 | 7.5 | undeveloped |
| DEMOGRAPHIC CHARATERISTICS | MEDIUM | 5 | 7.5 | undeveloped |
| PUBLIC PERCEPTION | LOW | | | *TBD in Phase II* |
| **SCORE** *(300 Possible)* | | | 153.5 | |

Current site score: 153.5

# 5.4.10 EVALUATION OF PROSPECTIVE SITE 10




WEST PLAINS:

The evaluation for West Plains is a yet-to-be-determined 25 acre property within the area bound by Craig Rd (west), Spotted Rd (east), Trails/Deno Rd (north) and McFarlane Rd (south). The area is zoned primarily Industrial, with some areas of Highway Corridor.

**PROPERTY 10** April 2025

*Value : Priority of criteria is of LOW (1.0), MEDIUM(1.5), or HIGH (2.0)*
*Rank: Ranking from 1 (LEAST EFFECTIVE) to 5 (MOST EFFECTIVE)*

| GENERAL LOCATION: | West Plains | SIZE: | 25 acres |
|---|---|---|---|
| LOCATION DESCRIPTION: | Vicinity bound by Craig Rd (west), Spotted Rd (east), Trails/Deno Rd (north) and McFarlane Rd (south) | | |

| CRITERIA | VALUE | RANK | SCORE | NOTES |
|---|---|---|---|---|
| **A) UTILITIES** | | | | |
| ELECTRIC | HIGH | 2 | 4 | Not near power hub. |
| SEWER | HIGH | 2 | 4 | No SS in close vicinity. |
| WATER | HIGH | 5 | 10 | In vicinity of the site |
| GAS | LOW | 4 | 4 | |
| HYDROGEN | MEDIUM | 4 | 6 | Larger lot size |
| **B) SITE CONDITIONS** | | | | |
| EXISTING SOILS | MEDIUM | 3 | 4.5 | Clay / Sand |
| EXISTING TERRAIN | LOW | 4 | 4 | Some steep slopes |
| FEMA / WETLANDS | LOW | 5 | 5 | No Wet Lands / FEMA Zone |
| **C) EASE OF ACQUISITION** | | | | |
| EXISTING OWNERSHIP TYPE: | MEDIUM | | | *TBD in Phase II* |
| ACQUISITION TYPE | MEDIUM | | | *TBD in Phase II* |
| AGGREGATION NEEDS | LOW | | | *TBD in Phase II* |
| ENVIRONMENTAL CLEANUP | HIGH | | | *TBD in Phase II* |
| SHOVEL READY | HIGH | | | *TBD in Phase II* |
| **D) SAFETY STANDARDS** | | | | |
| FUEL ACCESS | HIGH | | | *TBD in Phase II* |
| VISIBILITY / COLLISION CONTROL | HIGH | | | *TBD in Phase II* |
| QUEUING ABILITY | HIGH | | | *TBD in Phase II* |
| **E) RENEWABLE ENERGY OPPORTUNITIES** | | | | |
| WIND | LOW | | | *TBD in Phase II* |
| GEOTHERMAL | LOW | | | *TBD in Phase II* |
| SOLAR | MEDIUM | 5 | 7.5 | Sun exposure is equivalent across Spokane |
| **F) EMPLOYEE SATISFACTION** | | | | |
| WALKABILITY | LOW | 3 | 3 | |
| ACCESS TO AMENITIES | LOW | 4 | 4 | |
| ACCESS TO BUS ROUTES | LOW | 5 | 5 | |
| **G) OTHER CONSIDERATIONS** | | | | |
| COMPATIBLE W/ 2050 BUILD OUT | HIGH | 4 | 8 | |
| PARATRANSIT BOUNDARY IMPACT | LOW | | | *TBD in Phase II* |
| FUTURE FLEXIBILITY / EXPANSION CAPACITY | HIGH | 5 | 10 | |
| **H) TRANSPORTATION & PLANNING** | | | | |
| COMMUNITY/NEIGHBORHOOD IMPACT | HIGH | 5 | 10 | no nearby neighborhood |
| SUPPORTS TOD OPPORTUNITIES | LOW | | | *TBD in Phase II* |
| PROXIMITY TO RAIL/DELAY IMPACTS | MEDIUM | 5 | 7.5 | no nearby RR |
| PROXIMITY TO TRAFFIC CONGESTION | HIGH | 4 | 8 | low congestion |
| ACCESS TO MAJOR STREETS | MEDIUM | 5 | 7.5 | frontage on Hwy 2 |
| HISTORIC CRASH DATA REVIEW | LOW | 2 | 2 | above average crashes |
| **I) EPF/TITLE VI FEASIBLITY** | | | | |
| PUBLIC SAFETY/EMERGENCY RESPONSE | LOW | 3 | 3 | |
| SUPPORT SERVICES | LOW | 4 | 4 | |
| ENVIRONMENTAL IMPACT POTENTIAL | MEDIUM | 3 | 4.5 | vacant land |
| DISTRIBUTION OF EPFS | LOW | 1 | 1 | |
| COMPATIBALE LAND USE DESIGNATION | MEDIUM | 4 | 6 | commercial/industrial |
| ECONOMIC IMPACT | LOW | 5 | 5 | surrounding area undeveloped |
| AESTHETIC IMPACT | LOW | 5 | 5 | surrounding area undeveloped |
| ABILITY TO MITIGATE IMPACTS | MEDIUM | 4 | 6 | |
| DISPLACEMENT OF RESIDENTS | MEDIUM | 5 | 7.5 | undeveloped |
| DEMOGRAPHIC CHARATERISTICS | MEDIUM | 5 | 7.5 | undeveloped |
| PUBLIC PERCEPTION | LOW | | | *TBD in Phase II* |
| **SCORE** *(300 Possible)* | | | 163.5 | |

Current site score: 163.5

# 6.0 LOOKING FORWARD

# 6.0 NEAR TERM ACTIONS

**Clear near term actions and three initial projects have emerged from the results of this planning effort** that will carry on in Phase II of the Facilities Master Plan.

**Identify specific site options for thorough evaluation and select a preferred location for construction of a new, clean** energy maintenance, operations and administrative base as well as a new training facility

This will involve completion of the siting process for Essential Public Facilities (EPF) as required by Washington State (RCW 81.112.020) and as defined by Spokane County Municipal Code. The following are significant steps in the process.

- Complete analysis of functional criteria, to include route planning analysis by STA, of all potential sites to select the highest ranking 10 semi-finalist sites within the areas identified in section 5.0.
- Analyze the 10 semi-finalist sites using qualitative criteria and solicit public comment, resulting in the selection of 3 preferred sites, for which a public comment period should also be provided.
- Board of County Commissioners conducts a public hearing on the site list to allow for further public comment and to identify strategies to address any issues associated with particular sites and provide an advisory ranking of the finalist sites.

Pursue acquisition of property(ies) in preferred location

Once the preferred locations have been identified, STA's Planning and Development department will initiate the process of due diligence and acquisition for any property(ies) not currently owned.

**Establish scope of work, program, design and construct the three projects identified in the initial phase of this Plan:**

1 New Board Room and Executive Suite. Section 6.1 provides a pre-design schematic and brief description for this renovation at the STA Plaza.

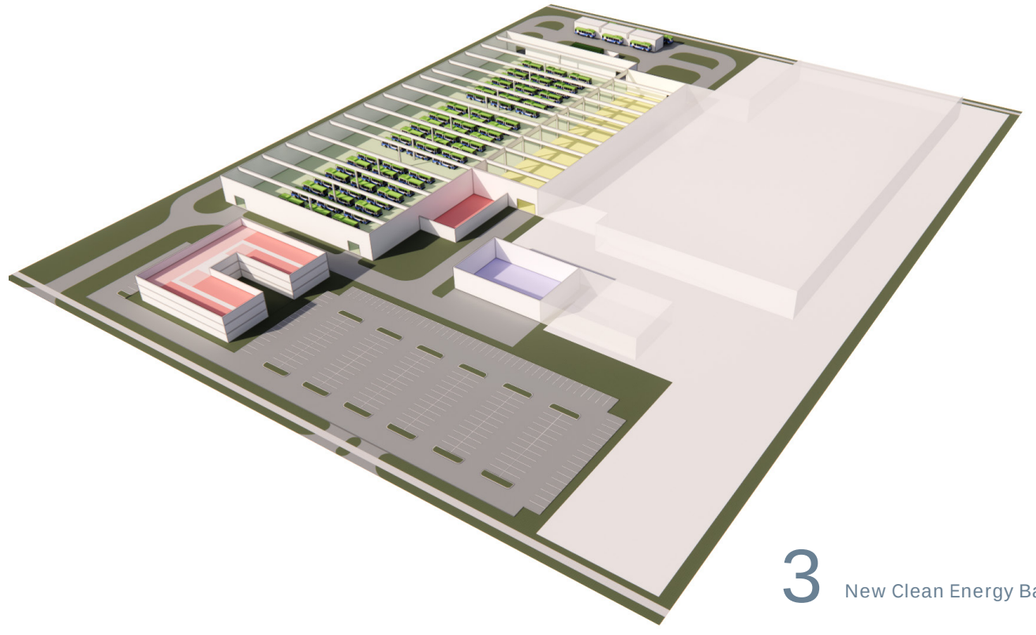
2 New Training Facility. It is expected that this project be prioritized and completed by 2030, as a part of the TDP. Section 6.2 provides a pre-design schematic and brief description for this expected scope of work.

3 New Clean Energy Base. It is expected that this project be prioritized and completed by 2030, as a component within the TDP. Sections 4, 5 and 6 provided pre-design framework for this project and section 6.3 provides additional schematic site requirements.





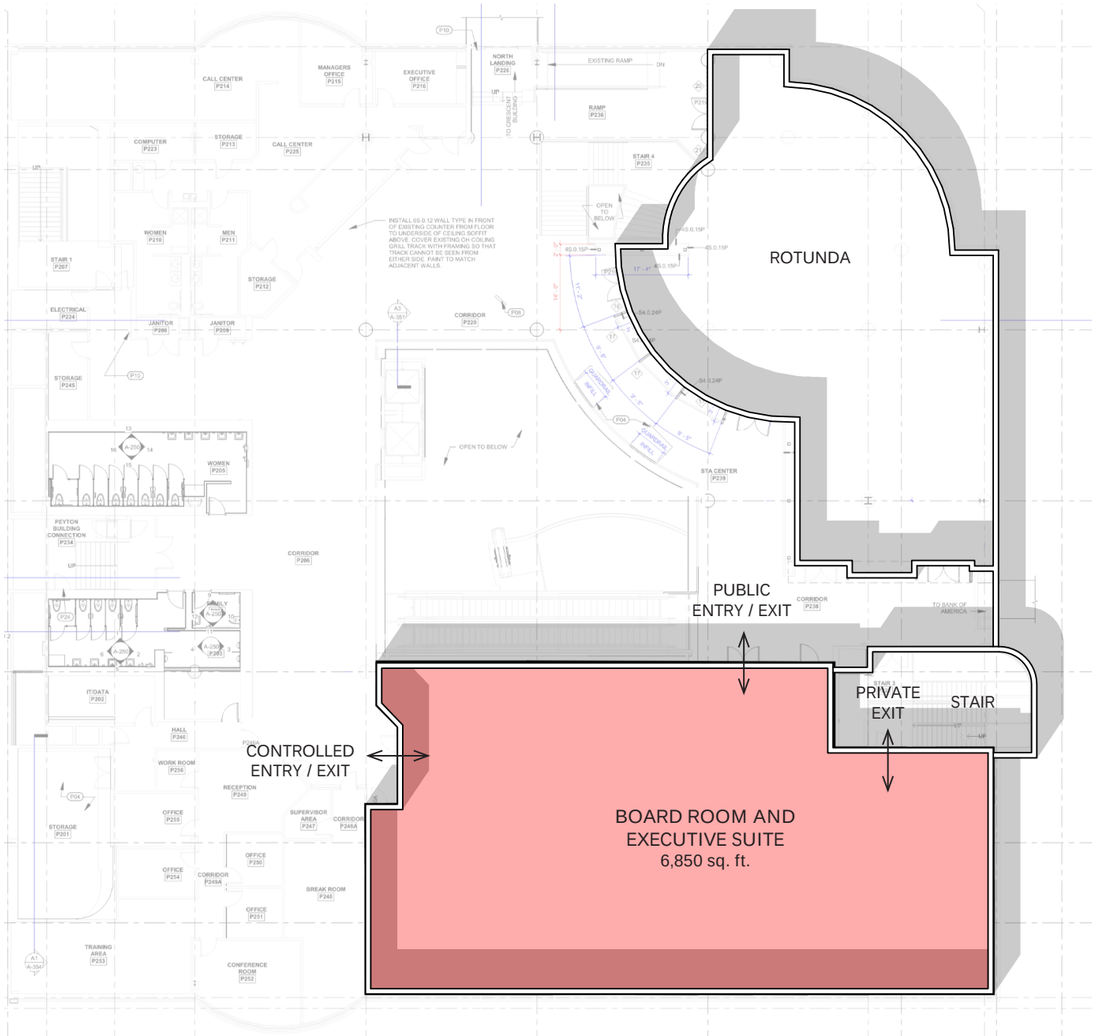
2 New Training Facility



3 New Clean Energy Base

# 6.1 BOARD ROOM / EXECUTIVE SUITE

There is a need for dedicated, effective and safe space to house regular and special meetings of STA's Board of Directors, with public attendance. An executive suite should be directly adjacent to this meeting space, which should also accommodate less-formal meetings with various public stakeholders and STA executive team members. It is important that this suite be readily accessible by various public partners and stakeholders, and it should represent a public face of STA to the broader community. Consistent with the goal of using existing assets to the greatest extent possible, the Board Room and Executive Suite are envisioned to be re-located in newly renovated space on level 2 of the STA Plaza.




*The southeast area of the second level of the Plaza downtown is adequately sized to accommodate a new Board Room and Executive Suite.*



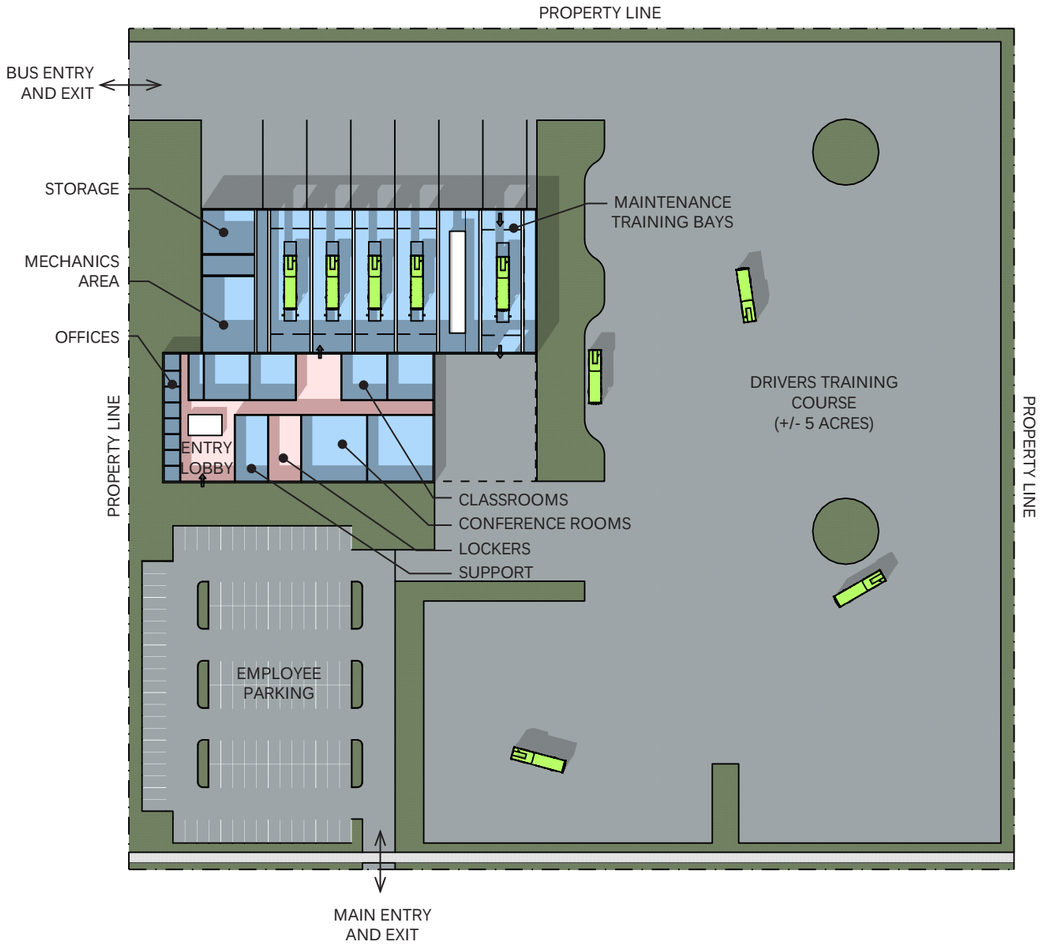
6.1 BOARD ROOM / EXECUTIVE SUITE

PLAZA

| | | % of SF | TOTAL SF | YEAR |
|---|---|---|---|---|
| ADMIN. - PUBLIC SPACES | | | **5,371 SF** | |
| | Entry Vestibule w Receptionist & Security | 100% | 518 SF | 2030 |
| | Board Room | 100% | 1,725 SF | 2030 |
| | Board Conf Room | 100% | 288 SF | 2030 |
| | Meeting Spaces | 100% | 1,921 SF | 2030 |
| | Public Restrooms | 100% | 575 SF | 2030 |
| | Board Restroom | 100% | 115 SF | 2030 |
| | Furniture Storage | 100% | 230 SF | 2030 |
| SHARED SPACES | | | **1,072 SF** | |
| | Conference Rooms (minus public meeting spaces) | 3% | 293 SF | 2030 |
| | Café / Break Room / Drivers / Multi Purpose / TV | 3% | 246 SF | 2030 |
| | Health and Wellness Spaces | 3% | 196 SF | 2030 |
| | Lockers & Showers | 3% | 225 SF | 2030 |
| | General Building Storage & Mailroom | 3% | 112 SF | 2030 |
| TRAINING | | | **0 SF** | |
| | Classrooms and Training Areas | 0% | 0 SF | |
| | Maintenance Training Bays | 0% | 0 SF | |
| | *(Trainers' offices included in Human Resourses)* | | | |
| ADMINISTRATION | | | **7,877 SF** | |
| | Executive Wing | 100% | 1,771 SF | 2030 |
| | Human Resources | | | |
| | Chief / Human Resources Offices | 0% | 0 SF | |
| | Safety / Training Offices | 0% | 0 SF | |
| | Security | 90% | 2,093 SF | 2030 |
| | Communications & Customer Service | | | |
| | Chief / Communications and Marketing | 0% | 0 SF | |
| | Business to Business | 0% | 0 SF | |
| | Customer Service | 100% | 3,833 SF | 2030 |
| | Web | 0% | 0 SF | |
| | Finance | | | |
| | Chief / Payroll and Auditing | 0% | 0 SF | |
| | Procurement | 0% | 0 SF | |
| | Information Services | 5% | 181 SF | 2030 |
| | Records | 0% | 0 SF | |
| | Planning & Development | | | |
| | Chief / Planning and Development Offices | 0% | 0 SF | |
| | Infrastructure Development | 0% | 0 SF | |
| | Service Development | 0% | 0 SF | |
| | Facilities Master Planning | 0% | 0 SF | |
| | Capital Development | 0% | 0 SF | |
| | BRT Development & Implementation | 0% | 0 SF | |
| | Planning and Grants | 0% | 0 SF | |
| | Community Development | 0% | 0 SF | |
| SERVICE DELIVERY - FIXED | | | **0 SF** | |
| | COO Offices | 0% | 0 SF | |
| | Supervisors and Dispatch | 0% | 0 SF | |
| | ZEB Storage / Charging | 0% | 0 SF | |
| PARATRANSIT | | | **0 SF** | |
| | Office Space | 0% | 0 SF | |
| | Van and Rideshare Storage | 0% | 0 SF | |
| MAINTENANCE | | | **0 SF** | |
| | Fixed Route Maintenance and Associated Office | 0% | 0 SF | |
| | Paratransit Maintenance and Associated Office | 0% | 0 SF | |
| FACILITIES & GROUNDS | | | **959 SF** | |
| | Office Space and Work Shops | 20% | 959 SF | 2030 |
| | Parking of STA Vehicles | 0% | 0 SF | |
| | Storage (Tools, Auction Items, Garbage/Rec., etc.) | 0% | 0 SF | |
| | *(Laydown Yard included in Exterior Spaces)* | | | |
| OVERALL BUILDING SUBTOTALS | | | 15,279 SF | |
| SUPPORT SPACES, ETC. | | | 1,528 SF | 2030 |
| | Fire, Mechanical, Electrical, Com, Janitorial | | | |
| | Building Circulation, Restrooms | | | |
| | Exterior Walls, shafts, etc. | | | |
| OVERALL BUILDING TOTALS | | | **16,807 SF** | |
| EXTERIOR SPACES | | | | |
| | Green areas for employees to gather | 0% | 0 SF | |
| | Drivers Training Course - New = 5 acres | 0% | 0 SF | |
| | Employee Parking - 313 Existing parking stalls - to 499 in 2050 | 0% | 0 SF | |
| | Visitor Parking - 12 Existing parking stalls - to 18 in 2050 | 0% | 0 SF | |
| | 380 SF per parking stall includes circulation and landscaping | | | |
| | Facilities & Grounds Laydown Yard | 0% | 0 SF | |
| EXTERIOR SPACE TOTALS | | | 0 SF | |

# 6.2 TRAINING FACILITY

There is a need for dedicated space to house the many different types and formats for training STA employees across all departments. Flexible classroom spaces, maintenance training bays and module storage, a fixed route driver's course and administrative training support spaces are all components that need dedicated, consolidated and centralized space. These spaces should be flexible and reconfigurable for a dual function to support various sized group gatherings, meetings and events. Further detailed programming will occur to right-size this facility, but it is expected to be around 51,300 sf. The driver's training course should be sized at 5 acres, which is smaller than the current 11 acre course but is expected to be sufficient.




*Shown above is a generic, 10-acre parcel demonstrating an arrangement of the high-level program requirements and anticipated site constraints for a new Training facility.*



6.2 TRAINING FACILITY

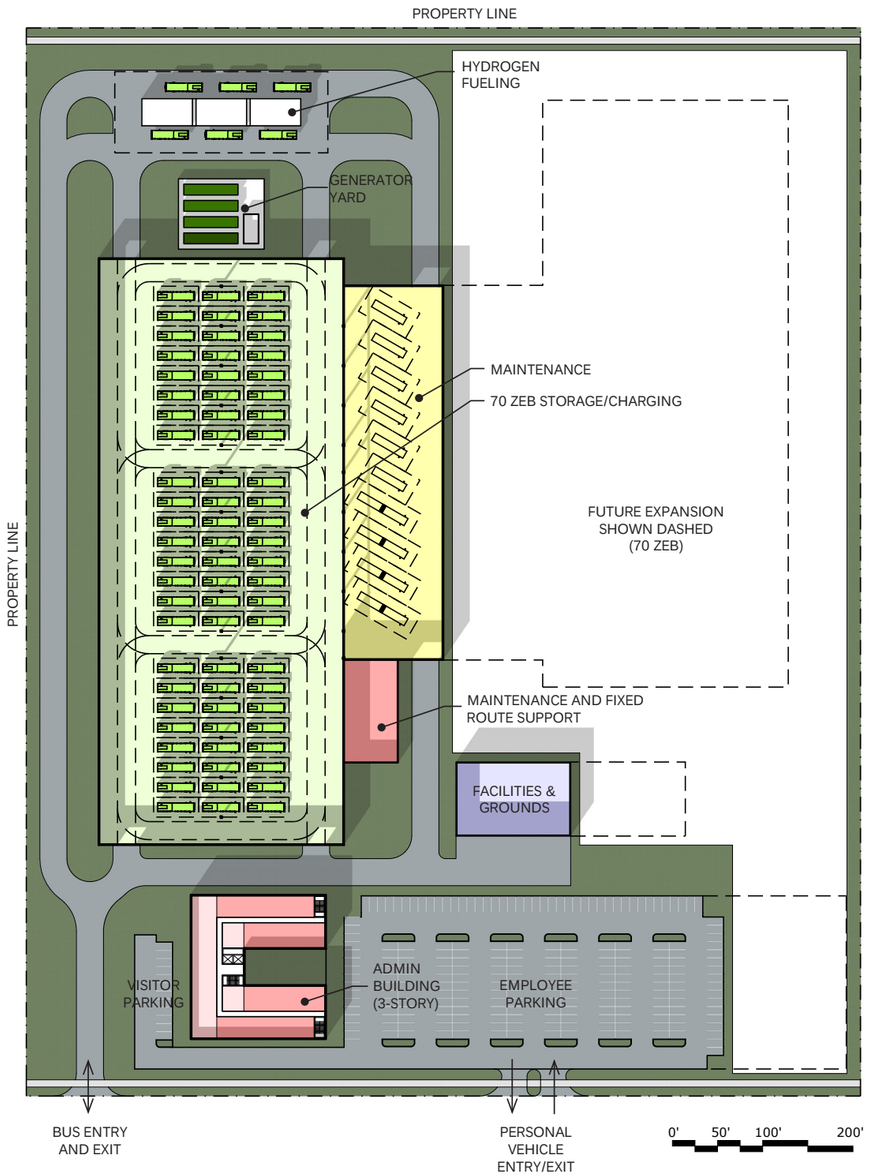
TRAINING

| | | % of SF | TOTAL SF | YEAR |
|---|---|---|---|---|
| ADMIN. - PUBLIC SPACES | | | **0 SF** | |
| | Entry Vestibule w Receptionist & Security | 0% | 0 SF | |
| | Board Room | 0% | 0 SF | |
| | Board Conf Room | 0% | 0 SF | |
| | Meeting Spaces | 0% | 0 SF | |
| | Public Restrooms | 0% | 0 SF | |
| | Board Restroom | 0% | 0 SF | |
| | Furniture Storage | 0% | 0 SF | |
| SHARED SPACES | | | **1,819 SF** | |
| | Conference Rooms (minus public meeting spaces) | | 0 SF | |
| | Café / Break Room / Drivers / Multi Purpose / TV | 7% | 574 SF | 2030 |
| | Health and Wellness Spaces | 7% | 458 SF | 2030 |
| | Lockers & Showers | 7% | 526 SF | 2030 |
| | General Building Storage & Mailroom | 7% | 262 SF | 2030 |
| TRAINING | | | **40,040 SF** | |
| | Classrooms and Training Areas | 100% | 9,240 SF | 2030 |
| | Maintenance Training Bays | 100% | 30,800 SF | 2030 |
| | *(Trainers' offices included in Human Resourses)* | | | |
| ADMINISTRATION | | | **2,406 SF** | |
| | Executive Wing | | 0 SF | |
| | Human Resources | | | |
| | Chief / Human Resources Offices | 0% | 0 SF | |
| | Safety / Training Offices | 90% | 2,225 SF | 2030 |
| | Security | 0% | 0 SF | |
| | Communications & Customer Service | | | |
| | Chief / Communications and Marketing | 0% | 0 SF | |
| | Business to Business | 0% | 0 SF | |
| | Customer Service | 0% | 0 SF | |
| | Web | 0% | 0 SF | |
| | Finance | | | |
| | Chief / Payroll and Auditing | 0% | 0 SF | |
| | Procurement | 0% | 0 SF | |
| | Information Services | 5% | 181 SF | 2030 |
| | Records | 0% | 0 SF | |
| | Planning & Development | | | |
| | Chief / Planning and Development Offices | 0% | 0 SF | |
| | Infrastructure Development | 0% | 0 SF | |
| | Service Development | 0% | 0 SF | |
| | Facilities Master Planning | 0% | 0 SF | |
| | Capital Development | 0% | 0 SF | |
| | BRT Development & Implementation | 0% | 0 SF | |
| | Planning and Grants | 0% | 0 SF | |
| | Community Development | 0% | 0 SF | |
| SERVICE DELIVERY - FIXED | | | **0 SF** | |
| | COO Offices | 0% | 0 SF | |
| | Supervisors and Dispatch | 0% | 0 SF | |
| | ZEB Storage / Charging | 0% | 0 SF | |
| PARATRANSIT | | | **0 SF** | |
| | Office Space | 0% | 0 SF | |
| | Van and Rideshare Storage | 0% | 0 SF | |
| MAINTENANCE | | | **0 SF** | |
| | Fixed Route Maintenance and Associated Office | 0% | 0 SF | |
| | Paratransit Maintenance and Associated Office | 0% | 0 SF | |
| FACILITIES & GROUNDS | | | **2,381 SF** | |
| | Office Space and Work Shops | 5% | 240 SF | 2030 |
| | Parking of STA Vehicles | 5% | 1,100 SF | 2030 |
| | Storage (Tools, Auction Items, Garbage/Rec., etc.) | 5% | 1,041 SF | 2030 |
| | *(Laydown Yard included in Exterior Spaces)* | | | |
| | OVERALL BUILDING SUBTOTALS | | 46,646 SF | |
| SUPPORT SPACES, ETC. | | | 4,665 SF | 2030 |
| | Fire, Mechanical, Electrical, Com, Janitorial | | | |
| | Building Circulation, Restrooms | | | |
| | Exterior Walls, shafts, etc. | | | |
| | OVERALL BUILDING TOTALS | | **51,311 SF** | |
| EXTERIOR SPACES | | | | |
| | Green areas for employees to gather | 7% | 840 SF | 2030 |
| | Drivers Training Course - New = 5 acres | 100% | 217,800 SF | 2030 |
| | Employee Parking - 313 Existing parking stalls - to 499 in 2050 | 7% | 13,273 SF | 2030 |
| | Visitor Parking - 12 Existing parking stalls - to 18 in 2050 | 7% | 479 SF | 2030 |
| | 380 SF per parking stall includes circulation and landscaping | | | |
| | Facilities & Grounds Laydown Yard | 0% | 0 SF | |
| | EXTERIOR SPACE TOTALS | | 232,392 SF | |

# 6.3 CLEAN ENERGY BASE

The operational planning phase of this study broke the future ZEB fleet into thirds to consider how facilities might be implemented in phases over the next 20 years. Those were referenced as Clean Energy Base (CEB) #1, #2 and #3. Under the preferred approach described in section 4, an option to consider CEB #2 as a phased expansion to CEB #1 was presented as a possible scenario.

While this has not yet been confirmed to be ideal from an operational standpoint, it is worth considering for sizing the site for the first Clean Energy Base.




*Shown above is a generic, 25-acre parcel demonstrating an arrangement of the high-level program requirements and anticipated site constraints for a new Clean Energy Base facility.*



6.3 CLEAN ENERGY BASE

## Site Requirements for a new Clean Energy Base

> Facility: The site should support the building of a new 83,625 sf clean energy maintenance and operations facility that accommodates the indoor storage, maintenance and support for 70 fixed-route, zero emissions buses, as well as administrative headquarters for STA. Space should be available to expand the maintenance and operations facility to accommodate another 70 fixed-route, zero emissions buses in a future expansion phase.

> Circulation: Spacing between stored fixed-route buses is planned for 10'-0" clear. Circulation parameters have been studied to ensure clearances are provided for safe maneuverability both inside the garage and across the site. During design, consideration should be given to eliminating the need for maneuvering a bus in reverse.

> Fueling: Whether the ZEB fleet is made up of BEBs or FCEBs, the site and facility should be able to accommodate the fueling, maintenance and operability for either. BEBs will require a significant amount of power from the local utility, as well as an amply-sized yard for back-up generators. FCEBs will require an area for hydrogen storage and dispensing, whether the H2 is purchased and delivered or produced onsite.

> Parking: Currently parking for 225 employees and 10 visitors is shown. Upon expansion of the facility, a parking structure may need to be considered to accommodate parking needs at that time.

> Energy: Space for onsite renewable energy should be considered. It is expected this would occur via rooftop photo-voltaic arrays, given the vast amount of rooftop that will be available at the garage. Consideration should also be given for infrastructure to support a micro grid at the campus.

## Placemaking Opportunities

> Opportunities for STA employees: A campus with shared spaces strategically configured throughout will create an environment where employees across all departments can gather to work collaboratively, foster innovation and embody a cohesive organizational culture. In addition to the various indoor spaces, outdoor areas such as patios for lunch breaks and informal meetings, or a perimeter walking loop to encourage employee wellness could be considered.

> Opportunities for the surrounding neighbors and community: The campus will have an opportunity to provide an outward-facing presence that benefits neighbors and the surrounding micro-community. By employing Crime Prevention Through Environmental Design (CPTED) measures, the new facility could enhance neighborhood safety. Strategic screening of less desirable components of the site, as well as thoughtful exposure of others, will contribute to STA's new Clean Energy Base being a friendly and welcoming presence to its neighbors.

> Opportunities for STA's exposure & message to the service-wide community: At a macro level, there are many opportunities for establishing the new Clean Energy Base as a place that embodies the values of STA as well as stakeholders across the greater Spokane service area. Thoughtful stewardship of public funds, innovative community leadership, and an employer that attracts and retains talented team members are all messages that this facility could broadcast about STA.

## Site Barriers and Limitations

> Setbacks: Property line setback requirements vary depending on the zoning of the parcel and neighboring parcels, and any utility easements that may be present. The diagram depicts a 15'-0" / 25'-0" setback. Where hydrogen fuel storage and dispensing occurs, there will likely be a setback requirement of around 50'-0", though this is not something that has yet been established by local AHJs.

> Zoning: The zoning designation for areas under consideration vary widely. Many of the parcels in the areas under consideration are zoned Industrial, which would be most suitable for this application. Any adjacent residentially zoned parcels will need to be considered for further zoning restrictions.

> Future Expansion: A phased expansion approach will be a consideration to accommodate the growing ZEB fleet. This diagram reflects the doubling of the fleet, from 70 to 140 ZEBs at this location.

# 6.3 CLEAN ENERGY BASE

| | | CEB #1 | | | CEB #2 | | |
|---|---|---|---|---|---|---|---|
| | | % of SF | TOTAL SF | YEAR | % of SF | TOTAL SF | YEAR |
| ADMIN. - PUBLIC SPACES | | | **0 SF** | | | **0 SF** | |
| | Entry Vestibule w Receptionist & Security | 0% | 0 SF | | 0% | 0 SF | |
| | Board Room | 0% | 0 SF | | 0% | 0 SF | |
| | Board Conf Room | 0% | 0 SF | | 0% | 0 SF | |
| | Meeting Spaces | 0% | 0 SF | | 0% | 0 SF | |
| | Public Restrooms | 0% | 0 SF | | 0% | 0 SF | |
| | Board Restroom | 0% | 0 SF | | 0% | 0 SF | |
| | Furniture Storage | 0% | 0 SF | | 0% | 0 SF | |
| SHARED SPACES | | | **14,534 SF** | | | **7,391 SF** | |
| | Conference Rooms (minus public meeting spaces) | 42% | 4,108 SF | 2030 | 22% | 2,159 SF | 2035 |
| | Café / Break Room / Drivers / Multi Purpose / TV | 40% | 3,288 SF | 2030 | 20% | 1,650 SF | 2035 |
| | Health and Wellness Spaces | 40% | 2,626 SF | 2030 | 20% | 1,318 SF | 2035 |
| | Lockers & Showers | 40% | 3,012 SF | 2030 | 20% | 1,512 SF | 2035 |
| | General Building Storage & Mailroom | 40% | 1,500 SF | 2030 | 20% | 753 SF | 2035 |
| TRAINING | | | **0 SF** | | | **0 SF** | |
| | Classrooms and Training Areas | 0% | 0 SF | | 0% | 0 SF | |
| | Maintenance Training Bays | 0% | 0 SF | | 0% | 0 SF | |
| | *(Trainers' offices included in Human Resourses)* | | | | | | |
| ADMINISTRATION | | | **33,892 SF** | | | **5,787 SF** | |
| | Executive Wing | 15% | 266 SF | | 15% | 266 SF | |
| | Human Resources | | | | | | |
| | Chief / Human Resources Offices | 90% | 1,697 SF | 2030 | 10% | 189 SF | 2035 |
| | Safety / Training Offices | 7% | 165 SF | 2030 | 7% | 165 SF | 2035 |
| | Security | 7% | 155 SF | 2030 | 7% | 155 SF | 2035 |
| | Communications & Customer Service | | | | | | |
| | Chief / Communications and Marketing | 90% | 2,396 SF | 2030 | 10% | 266 SF | 2035 |
| | Business to Business | 100% | 414 SF | 2030 | 0% | 0 SF | 2035 |
| | Customer Service | 0% | 0 SF | 2030 | 0% | 0 SF | 2035 |
| | Web | 90% | 1,692 SF | 2030 | 10% | 188 SF | 2035 |
| | Finance | | | | | | |
| | Chief / Payroll and Auditing | 90% | 3,229 SF | 2030 | 10% | 359 SF | 2035 |
| | Procurement | 80% | 11,482 SF | 2030 | 20% | 2,870 SF | 2035 |
| | Information Services | 80% | 2,889 SF | 2030 | 10% | 361 SF | 2035 |
| | Records | 90% | 2,107 SF | 2030 | 10% | 234 SF | 2035 |
| | Planning & Development | | | | | | |
| | Chief / Planning and Development Offices | 100% | 515 SF | 2030 | 0% | 0 SF | 2035 |
| | Infrastructure Development | 90% | 1,307 SF | 2030 | 10% | 145 SF | 2035 |
| | Service Development | 90% | 1,307 SF | 2030 | 10% | 145 SF | 2035 |
| | Facilities Master Planning | 100% | 138 SF | 2030 | 0% | 0 SF | 2035 |
| | Capital Development | 90% | 1,321 SF | 2030 | 10% | 147 SF | 2035 |
| | BRT Development & Implementation | 100% | 138 SF | 2030 | 0% | 0 SF | 2035 |
| | Planning and Grants | 90% | 1,573 SF | 2030 | 10% | 175 SF | 2035 |
| | Community Development | 90% | 1,102 SF | 2030 | 10% | 122 SF | 2035 |
| SERVICE DELIVERY - FIXED | | | **150,983 SF** | | | **149,570 SF** | |
| | COO Offices | 52% | 273 SF | 2030 | 24% | 126 SF | 2035 |
| | Supervisors and Dispatch | 52% | 2,352 SF | 2030 | 24% | 1,086 SF | 2035 |
| | ZEB Storage / Charging | 33% | 148,358 SF | 2030 | 33% | 148,358 SF | 2035 |
| PARATRANSIT | | | **0 SF** | | | **0 SF** | |
| | Office Space | 0% | 0 SF | | 0% | 0 SF | |
| | Van and Rideshare Storage | 0% | 0 SF | | 0% | 0 SF | |
| MAINTENANCE | | | **45,647 SF** | | | **34,235 SF** | |
| | Fixed Route Maintenance and Associated Office | 40% | 45,647 SF | 2030 | 30% | 34,235 SF | 2035 |
| | Paratransit Maintenance and Associated Office | | 0 SF | | | 0 SF | |
| FACILITIES & GROUNDS | | | **9,525 SF** | | | **9,525 SF** | |
| | Office Space and Work Shops | 20% | 959 SF | 2030 | 20% | 959 SF | |
| | Parking of STA Vehicles | 20% | 4,400 SF | 2030 | 20% | 4,400 SF | |
| | Storage (Tools, Auction Items, Garbage/Rec., etc.) | 20% | 4,166 SF | 2030 | 20% | 4,166 SF | |
| | *(Laydown Yard included in Exterior Spaces)* | | | | | | |
| OVERALL BUILDING SUBTOTALS | | | 254,581 SF | | | 206,508 SF | |
| SUPPORT SPACES, ETC. | | | 25,458 SF | 2030 | | 20,651 SF | 2035 |
| | Fire, Mechanical, Electrical, Com, Janitorial | | | | | | |
| | Building Circulation, Restrooms | | | | | | |
| | Exterior Walls, shafts, etc. | | | | | | |
| OVERALL BUILDING TOTALS | | | **280,039 SF** | | | **227,159 SF** | |
| EXTERIOR SPACES | | | | | | | |
| | Green areas for employees to gather | 40% | 4,814 SF | 2030 | 20% | 2,416 SF | 2035 |
| | Drivers Training Course - New = 5 acres | 0% | 0 SF | | 0% | 0 SF | |
| | Employee Parking - 313 Existing parking stalls - to 499 in 2050 | 40% | 76,067 SF | 2030 | 20% | 38,174 SF | 2035 |
| | Visitor Parking - 12 Existing parking stalls - to 18 in 2050 | 40% | 2,744 SF | 2030 | 20% | 1,377 SF | 2035 |
| | 380 SF per parking stall includes circulation and landscaping | | | | | | |
| | Facilities & Grounds Laydown Yard | 0% | 0 SF | | 0% | 0 SF | |
| EXTERIOR SPACE TOTALS | | | 83,625 SF | | | 41,967 SF | |



# 6.4 PROJECT COSTS

Early stage estimates have been produced to establish a rough order of magnitude (ROM) expectation for each of the identified projects. These estimates will be updated as programming refinements and pre-design scope of work exercises occur and as assumptions are further validated. The current estimates include building and site (where applicable) construction costs, estimated escalation factors and allowance for project soft costs (such as sales tax, surveying, engineering and design fees, plan review, permitting and impact fees, furnishings, fixtures and equipment, among other project administrative costs).

## > Training Facility (51,300 sf + 5 ac)

| | |
|---|---|
| ESTIMATED ROM COST OF CONSTRUCTION | $ 23,649,100 |
| **assumes new construction: a mix of pre-engineered metal building and/or concrete tilt-up, with traditional construction* | |
| **includes site development costs and contractor fees* | |
| ESTIMATED ESCALATION TO Q1 2027 | $ 2,583,197 |
| PROJECT SOFT COST ALLOWANCE (45%) | $ 11,804,534 |
| TOTAL ROM PROJECT COST | $ 38,036,830 |

## > Board Room / Executive Suite (6,800 sf)

| | |
|---|---|
| ESTIMATED ROM COST OF CONSTRUCTION | $ 1,428,000 |
| **assumes cost for tenant improvement renovation and construction activities within an occupied building* | |
| **includes contractor fees* | |
| ESTIMATED ESCALATION TO Q1 2026 | $ 75,970 |
| PROJECT SOFT COST ALLOWANCE (35%) | $ 526,389 |
| TOTAL ROM PROJECT COST | $ 2,030,359 |

## > Clean Energy Base and Administrative Headquarters (280,000 sf)

| | |
|---|---|
| ESTIMATED ROM COST OF CONSTRUCTION | $100,800,000 |
| **assumes new construction: a mix of pre-engineered metal building and/or concrete tilt-up, with traditional construction* | |
| **includes site development costs and contractor fees* | |
| ESTIMATED ESCALATION TO Q1 2027 | $ 29,821,535 |
| PROJECT SOFT COST ALLOWANCE (40%) | $ 52,248,614 |
| TOTAL ROM PROJECT COST | $182,870,150 |

# 6.5 FUNDING CONSIDERATIONS AND OPPORTUNITIES

The costs associated with expanding facilities to accommodate STA's growing and changing fleet will be substantial, requiring a strategic and multi-faceted funding approach which will be developed in the next phase of the Facilities Master Plan. Many considerations will be factored into the process of designing a funding strategy, not limited to the following:

- STA is expected to follow Federal Acquisition Regulations (FAR) for any properties that are identified for a new Clean Energy Base.
- Tax exemptions are offered for various types of construction and equipment. Any and all such exemptions available and applicable at the time of construction will be leveraged to the greatest extent possible. For example, Rule 171 is a tax exemption for Public Road Works and often applies to portions of facility builds that support service, buses and paratransit vehicles.
- STA will pursue any and all relevant grant opportunities available at the time of construction. Several currently available, relevant grants specific to transit are listed below for reference. Many more are expected to be available to assist with constructing sustainable, resilient, energy efficient buildings. This list will be expanded, tracked and updated as planning progresses over time.
- The uncertain nature of FAR and grant awards carry inherent risks in their unknowns, approval processes, highly competitive awarding, etc, which can ultimately affect project schedules or overall cost. Strategies will need to maintain consideration for such risks and prioritize and implement accordingly.

## Grant Opportunities:

- Rebuilding American Infrastructure with Sustainability and Equity (RAISE) discretionary grants: The USDOT oversees this program, which provides funding for public transportation projects eligible under chapter 53 of title 49, United States Code and planning of eligible projects. Formerly known as TIGER.
- Pilot Program for Transit-Oriented Development Planning Program: The Federal Transit Authority (FTA) is offering funding for planning to integrate land use and transportation planning with new fixed guideway or core capacity transit capital investments.
- Carbon Reduction Program: Through the 2021 Bipartisan Infrastructure Law (BIL) and Spokane Regional Transportation Council, this program funds projects that are designed to reduce transportation-related carbon dioxide emissions. 65% of funds are allocated to Metropolitan Planning Organizations based on population, and 35% are available for use in any area of the state. Includes public transportation projects eligible under 23 U.S.C. 142. Also eligible are projects that support deployment of alternative fuel vehicles, including:
    - Acquisition, installation, or operation of publicly accessible electric vehicle charging infrastructure or hydrogen, natural gas, or propane vehicle fueling infrastructure; and
    - Purchase or lease of zero-emission construction equipment and vehicles, including the acquisition, construction, or leasing of required supporting facilities
- Congestion Mitigation and Air Quality Improvement Program: Via SRTC, funds programs that help States comply with Clean Air Act requirements. The BIL continues all prior CMAQ eligibilities, and adds four new eligibilities:
    - Shared micromobility, including bikesharing and shared scooter systems;
    - The purchase of diesel replacements, or medium-duty or heavy-duty zero emission vehicles and related charging equipment;
    - In alternative fuel projects, vehicle refueling infrastructure that would reduce emissions from nonroad vehicles and nonroad engines used in construction projects or port-related freight operations.
- State of Good Repair Grants - 5337: The Federal Transit Authority (FTA) is offering to provide capital assistance for maintenance, replacement, and rehabilitation projects of high-intensity fixed guideway and motorbus systems to help transit agencies maintain assets in a state of good repair in urbanized areas. Eligible projects include maintenance facilities and equipment. Funds may also be used to develop and implement transit asset management plans. STA is currently ineligible for this program.
- Job Access and Reverse Commute Program (JARC) - 5316 (FTA): Eligible activities include capital, planning and operating expenses for projects that transport low-income individuals to and from jobs and activities related to employment, and for reverse commute projects.
- Buses and Bus Facilities Formula Program - 5339(a) (FTA): A Federal formula grant, this program provides funding to states and transit agencies through a statutory formula to replace, rehabilitate and purchase buses and related equipment and to construct bus-related facilities, including technological changes or innovations to modify low or no emission vehicles or facilities.
- Grants for Buses and Bus Facilities Competitive Program - 5339(b) (FTA): Similar to 5339(a), but structured as a competitive program.
- State Buses and Bus Facilities Grant Program: Part of a WSDOT consolidated grant, this program provides funding to transit agencies for replacement, expansions, rehabilitation, and purchase of transit rolling stock; construction, modification, or rehabilitation of transit facilities; and funding to adapt to technology change or innovation through retrofitting of transit rolling stock and facilities.
- Low or No Emission Vehicle Program - 5339(c) (FTA): Funding to state and local governmental authorities for the purchase or lease of zero-emission and low-emission transit buses as well as acquisition, construction, and leasing of required supporting facilities. Eligible projects include:
    - Purchasing or leasing low- or no-emission buses
    - Acquiring low- or no-emission buses with a leased power source
    - Constructing or leasing facilities and related equipment (including intelligent technology and software) for low- or no-emission buses
    - Constructing new public transportation facilities to accommodate low- or no-emission buses
    - Rehabilitating or improving existing public transportation facilities to accommodate low- or no-emission buses
- WSDOT Green Transportation Capital Grants: Provides funding to transit agencies for cost-effective capital projects that reduce the carbon intensity of the Washington transportation system. Capital projects and related expenditures may include:
    - Electrification of vehicle fleets, including battery and fuel cell operated electric vehicles
    - Updating or modifying facilities for fleet electrification and/or hydrogen refueling infrastructure. New facilities that directly and primarily support fleet electrification.
    - Construction of charging and fueling stations
    - Necessary upgrades to electrical transmission and distribution systems
    - In-house staff directly managing a capital construction or equipment/vehicle procurement project
    - Acquisition of property rights for capital projects
    - Planning activities (contingent upon legislative appropriation of funding). Planning may include, but is not limited to, zero-emission fleet transition planning, alternatives analyses, major investment studies, preliminary design/ engineering, project-level environmental assessment and documentation, and final design.
- WSDOT Surface Transportation Block Grant (STBG): WSDOT allocates STBG funds to Metropolitan Planning Organizations (MPO's) and County Lead Agencies for prioritizing and selecting projects that align with their regional priorities involving all entities eligible to participate in a public process. Eligible projects include highway/bridge construction/repair; transit capital projects; bicycle, pedestrian and recreational trails; and construction of ferry boats and terminals.

# 7.0 APPENDIX

## I. INTRODUCTION

### SUPPLEMENTAL INFORMATION

This portion (Chapter 4) of the “Connect 2035:  Spokane Transit Authority Strategic Plan” [December 19, 2024] is being included for reference to stated, goals and planned projects and investments.

# *Connect 2035* Projects and Investments

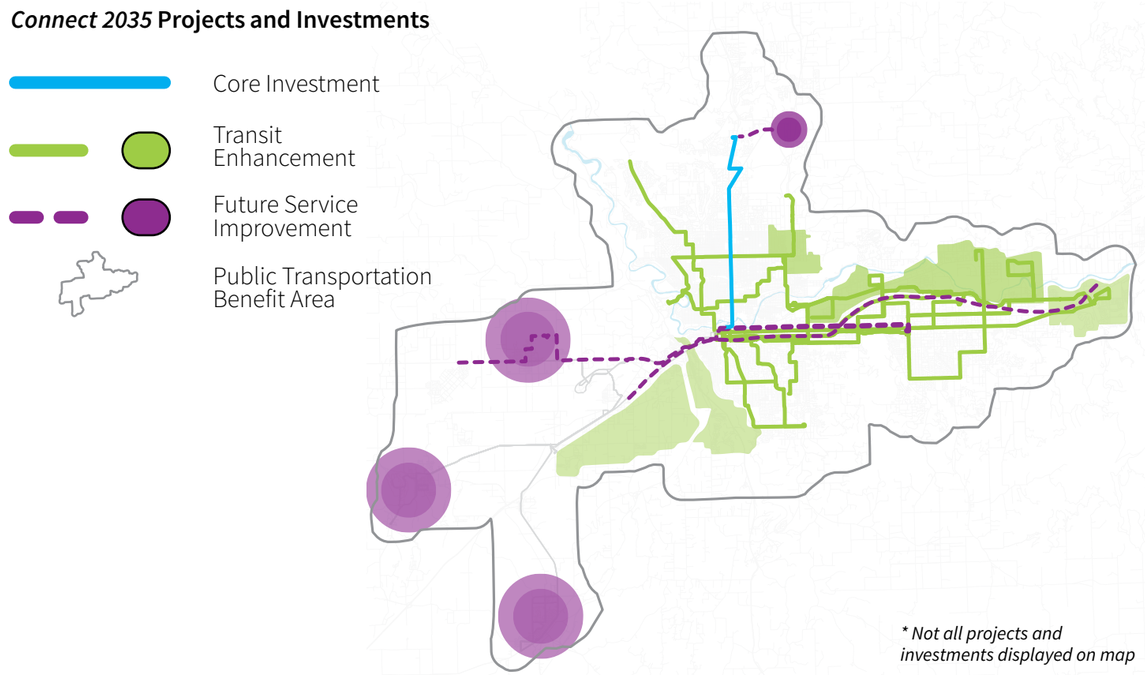
Guided by what we heard from community members and our stakeholders, *Connect 2035* outlines the real work that we are committing to delivering over the next 10 years. The following projects and investments align with our three core goals and seek to strengthen transit access and equity across our region.

## Transit Investments for Stronger Communities

As the Spokane Region grows and evolves, the role of convenient, reliable transit becomes more critical in addressing challenges such as traffic congestion, environmental impact, and equitable access to transportation. Strategic investments in infrastructure, technology, and services not only enhance the daily experience for customers, but also contribute to the economic vitality of our region by connecting people to jobs, education, and services. The following section outlines the projects and investments we will undertake over the next decade to help connect communities and shape a thriving region. The Connect 2035 projects and investment are divided into three categories:

| | |
|---|---|
| **Core Investments** | Major projects that will further all three of our strategic goals and underpin our strategic direction for the decade ahead. |
| **Transit Enhancements** | Improvements we will deliver with our existing resources to elevate the customer experience, grow community partnerships, and strengthen our organization. |
| **Futue Service Improvements** | Projects that respond to needs highlighted by the community and would meet growing demand; however, these will require a new, sustainable funding source to deliver. |

***Connect 2035* Projects and Investments**




** Not all projects and investments displayed on map*

# Transit Investments for Stronger Communities

STA is planning a robust package of investments based off community engagement that will improve the customer experience, better connect communities, support our growing economy, and sustain our health and environment.

Not all projects and investments are depicted here and additional information on these projects is provided in the following section.

**Invest in our operators** by upgrading break rooms and on route amenities

Install signage and develop new rider resources in **languages other than English**

Work with municipal partners to further **Transit-Oriented Development**

Expand our network of **High Performance Transit Lines**

Update routes to better **connect to new employment centers**

Employment Center

Continue our transition to a **zero-emission bus fleet**

Integrate **transit fares with event tickets**

Complete the **Division Street Bus Rapid Transit** project

**Run more buses on evenings and weekends** on high-demand routes

Pilot a **reduced fare program for low-income riders**

Create a **safety ambassador program**

STA Plaza

Launch **mobility-on-demand pilots** to serve new areas

**Enhance bus stops** with shelters and lighting

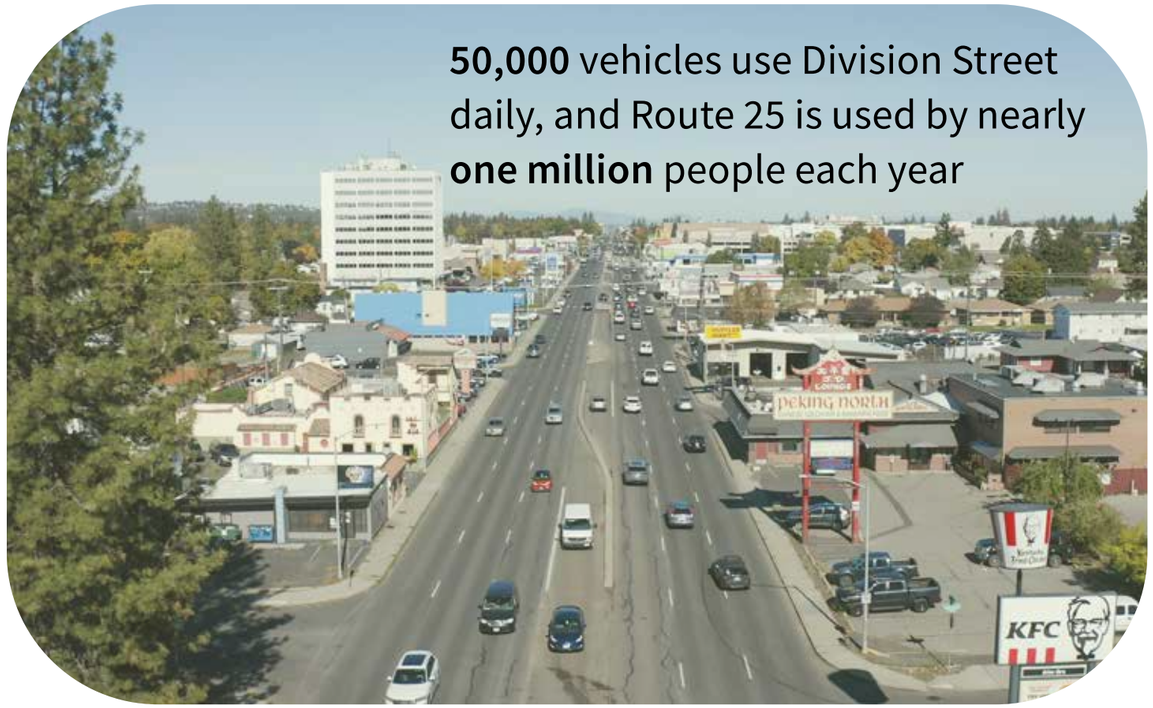
## **Core Investments:** Division Street BRT

Division Street serves as a vital thoroughfare for thousands of people traveling to their homes, workplaces, and other essential destinations.

The Division Street Bus Rapid Transit (BRT) project is estimated to launch with the completion of the North Spokane Corridor in 2030. **The new BRT line will run for ten miles from downtown Spokane north to Mead**.

In 2019, the STA and the Spokane Regional Transportation Council (SRTC), in collaboration with the City of Spokane, Spokane County, and the Washington State Department of Transportation (WSDOT), conducted the DivisionConnects study to explore potential enhancements and improvements to the Division Street corridor.

STA is in the process of securing federal funding to deliver the project and has secured a commitment of $50 million from the state through the Move Ahead Washington transportation package.




## **Core Investments:** Clean Energy Campus & Zero Emission Buses

We are continuing our work to create a healthier region and reduce greenhouse gas emissions by purchasing zero emission vehicles and building a **new clean energy campus for STA** to store and charge these vehicles.

**Clean Energy Campus**

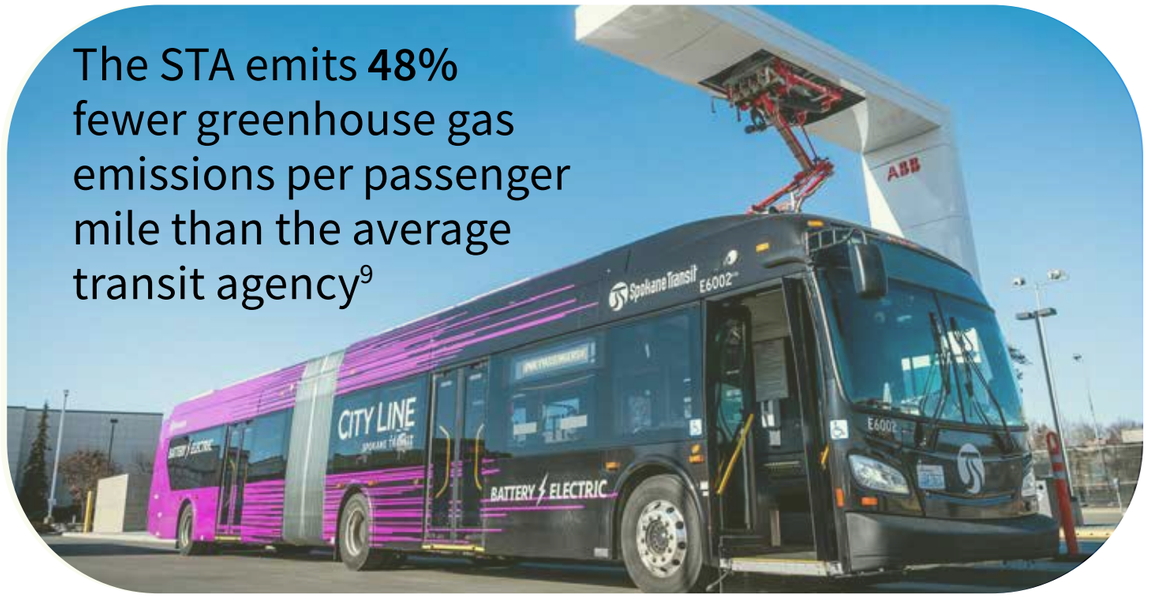
STA is committed to reducing the carbon impact of our campus through new and energy-efficient facilities. The new campus will contribute to our operational efficiency that have lower maintenance costs. The future campus showcases our commitment to sustainability and positions STA as a leader in environmental responsibility, inspiring broader adoption of similar practices.

**Zero Emission Vehicles**

STA currently has 36 battery electric buses and aims to achieve a **100% zero-emission bus fleet by 2045** to meet state requirements.

To date STA has primarily funded the transition to zero-emission technologies through available grant funding and will continue to identify, pursue, and leverage these opportunities to reduce the burden on Spokane taxpayers.

In addition to environmental benefits, zero emission buses offer lower operating and maintenance costs, helping to ensure the long-term financial sustainability of our transit system.

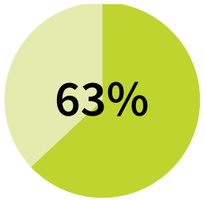


# **Goal 1:** Elevate the Customer Experience

Throughout the *Connect 2035* planning process, we have heard many ideas from riders and community members about how we can continue to update our services, roll out new features, and provide more amenities that will elevate the customer experience. With our existing resources, STA will pursue the following improvements.

**Updating Bus Routes**

Where, when, and how people are traveling around our region has changed over the last several years as a result of the COVID-19 pandemic. We closely monitor these trends, regularly engage with our riders, and listen to rider requests to identify ways to improve our bus routes and service. In the coming years we will be adding more night and weekend service on key routes with high ridership and that serve important job centers, updating service in Spokane Valley to respond to growth and increasing demand, and adjusting routes to better connect to new and emerging employment centers.



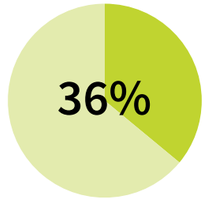

Updating Bus Routes was the most highly rated investment to improve customer experience based on community feedback (selected by 63% of more than 500 survey respondents).

**Improving Bus Stops**

Our riders deserve a safe place to wait for the bus that is protected from the elements. We will invest in improving safety and comfort for riders by adding 100 new shelters across the system—increasing the number of shelters by 50%— and installing lighting at every bus stop with a shelter.

*In a survey of more than 1,000 bus riders and community members,* ***adding shelters and lighting were the top two investments respondents felt would improve the experience of waiting at the bus stop*** *the most.*

STA's five current High Performance Transit lines account for more than a third (36%) of our ridership on a typical weekday. Over the next 10 years, we will be making major investments to bring the benefits of High Performance Transit to more communities and better connect people across the region.




Share of all STA rides on a typical weekday on existing High Performance Transit lines.

**Upgrade Route 33 Wellesley to a High-Performance Transit Line**

Route 33 – Wellesley is an important cross-town route traveling from Spokane Falls Community College to Spokane Community College and passing through a number of diverse neighborhoods. Route 33 – Wellesley already has frequent service with buses coming every 15 minutes for most of the day, and this project would invest in enhanced stations and amenities to increase safety, comfort, and the overall experience for riders.

**Planning and Designing the Next Round of High Performance Transit Lines**

Across the many surveys, listening sessions, community events, and open houses we have conducted to hear from community members, our riders have consistently said that increasing frequency and creating more High Performance Transit lines are the most meaningful ways STA can improve their experience and make the system more convenient and useful. Based on rider feedback, ridership data, and analysis of regional travel patterns and growth, we have identified three high-priority future HPT lines. We will also continue to evaluate opportunities for future high-capacity transit corridors.

- Route 61 – Highway 2/Fairchild
- Extending Route 9 – Sprague to Liberty Lake
- Extending Division Street BRT from its current planned end point at the Hastings Park and Ride east into Mead

# **Goal 1:** Elevate the Customer Experience

### Safety Ambassadors

Of STA riders, 70% report feeling safe while riding the bus compared to a national average of 42% of transit users. Throughout this planning process, though, we've also heard significant input around the need to improve the sense of safety and security throughout our system.

Aside from the bus being on time, feeling safe on the bus is our riders' highest priority. To help address these issues, STA will pilot a new safety ambassador program to help foster a safe, welcoming environment for all our customers.

### Streamlining Paratransit Booking

STA provides more than 1,000 Paratransit trips a day, connecting people with disabilities to destinations across the region. In order to make it easier and more convenient for paratransit users to book their rides, we are creating a new platform for Paratransit users to schedule their trips online versus having to call in to book trips.

### Improve Real-Time Information

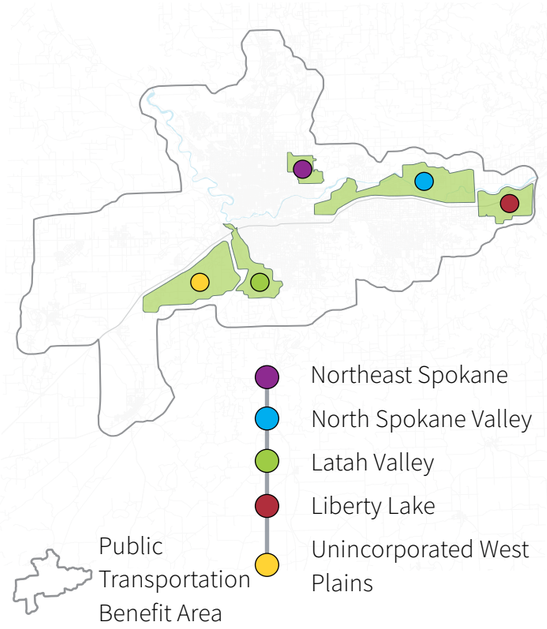
We know that riders value access to real-time information about when the next bus is arriving and count on that information to be accurate. In order to continually improve the reliability of real-time information, we will upgrade our backend technology systems to enable better, more accurate information for our riders.

### New Mobility-On-Demand Services

STA will pilot new Mobility-on-Demand services (technology-enabled services like Uber or Lyft but with multi-passenger vehicles) in four locations across the region to expand transit coverage and better connect workers to jobs: North Spokane Valley, Latah Valley, Liberty Lake, unincorporated portions of the West Plains, and Northeast Spokane.

Input from community members highlighted these areas as fast-growing locations that would benefit from transit service, and piloting Mobility-on-Demand will provide STA with information on the cost effectiveness and customer response to this new type of service. We will also develop a Mobility-on-Demand program to serve targeted geographic locations and trip types that are not well-served by the fixed-route bus network.

### Planned Mobility-on-Demand Service Areas




## *Case Study: TriMet Ambassador Program*[10]

*The Tri-County Metropolitan Transportation District's (TriMet) ambassador program is designed to serve riders and encourage safe transportation use. TriMet Ambassadors are contracted to help people learn about the transit system, safety, and trip planning throughout the Portland area. Ambassadors have mental health training, carry water, dry socks, and other supplies, answer questions, and help handle situations that would otherwise result in calls to security or the police.*

*The TriMet ambassador program is a product of a Transit Public Safety Advisory Committee comprised of regional thought leaders, community representatives and national transit experts. The committee used feedback gathered through surveys and listening sessions to develop targeted safety improvements.*

## *Case Study: King County Metro Flex*[11]

*King County Metro's Metro Flex service is designed to help residents access public transportation by providing on-demand rides to and from transit hubs. These rides are typically shared with other passengers and transport people from their homes, work, or nearby locations to major transit stations in the Seattle area.*

*Initially launched as a pilot program, Metro Flex now operates in five specific areas of King County. Fares are priced similarly to regular buses, and payment is integrated with ORCA cards, which are used for fare payment on public transit across the Puget Sound region.*

# **Goal 2:** Lead and Collaborate with Community Partners

We operate in our region's ecosystem, delivering transportation options for community members. Creating strong partnerships will ensure that we make informed choices, through collaboration, that benefit everyone and contribute to the vibrancy and sustainability of this region now and in the future. Leveraging our existing resources, STA will pursue the following improvements.

**Pilot a Reduced Fare Program for Riders Experiencing Low Incomes**

Even as the price of most goods and services has increased in recent years, STA has maintained our regular fare of $2 for bus and Paratransit rides. We have also introduced new programs, like free rides for youth 18 and under, and innovations such as fare capping. Fare capping limits the total amount a rider pays over a certain period of time, such as a day, week, or month. At STA, fares are capped at $4 a day or $60 monthly.

To further our vision of Connecting Everyone to Opportunity, we will pilot a reduced fare program for riders experiencing low incomes. Defining the parameters of the pilot program, such as the discount and eligibility requirements, will involve significant engagement with the public and stakeholders.

## *Case Study: ORCA Lift*[12]

*King County Metro's ORCA Lift Program is a reduced-fare transit initiative in the Seattle area aimed at providing affordable public transportation for low-income individuals. Administered by various transit agencies in the Puget Sound region, the program offers a significant discount on fares, often 50% lower than regular adult fares, across multiple modes of public transportation, including buses, light rail, streetcars, ferries, and trains. The program is designed for residents whose income is at or below 200% of the federal poverty level. The program is a vital resource for ensuring that public transportation remains accessible for those facing economic hardships.*

**Empower New Riders to Use the Bus**

Special Mobility Services, a partner of STA, offers a robust travel training program that provides one-on-one assistance to help people learn how to use the bus system to travel independently. More than three out of four STA riders report feeling confident navigating the system and say it is easy to find information on services, routes, and schedules. Partnering with CBOs, we will work to increase programs teaching new riders to use the bus, with a specific focus on reaching disadvantaged communities.

**Encourage More Housing and Employment Near STA's Transit Services**

As a growing region, working to encourage more housing and employment to locate near transit benefits everyone—lowering costs for families, increasing transit ridership, reducing congestion, and improving air quality. We will work with our municipal partners across the region to fund planning efforts for transit-oriented development (TOD), laying the groundwork for future mixed-use development and growth along key transit corridors.

**Electric Vehicle Charging**

As more households across the region purchase electric vehicles, STA will work to expand access to convenient, public electric vehicle charging at our park-and-rides and other facilities. We will work with our partners at Avista and the Spokane Regional Transportation Council to tap into state and federal programs to support this work.

**Enhance Transit Information Accessibility**

More than 7% of households in Spokane County speak a language other than English at home. STA will work with community partners to raise awareness of existing information on our services in languages other than English and identify the need for additional rider resources and signage in other languages.

***"Our community's demographics are changing, and we need to provide services in the languages our community speaks."***
*– Community Survey respondent*

## *Case Study: Division Street TOD Pilot*

*The Division Street TOD Pilot is a community-based plan to produce a corridor-wide vision for transit-oriented development (TOD) along the Division Street corridor. The project was established in 2022 as a collaboration between the City of Spokane, Spokane County, and the STA, and funded by the Federal Transit Administration's Pilot Program for TOD Planning. The plan is currently in its concept development phase and is set to propose a community-based vision recommending plans and policies that guide land use and maximize the high-frequency transit along Division Street.*

*The TOD plan also builds on the assessment of a locally preferred alternative for BRT on Division Street. Consequently, the regional effort on Division Street will guide future investments that support historically marginalized communities since it runs through seven high risk neighborhoods.*

# **Goal 2:** Lead and Collaborate with Community Partners

### Expand Partnerships with Employers

Of STA riders, 12% get their bus pass through their employer and STA's Employer Sponsored Bus Pass Program, which allows employers to purchase discounted Connect fares and passes. As the number of jobs in our region continues to grow, we will work to expand and deepen these partnerships, working with Commute Smart Northwest to invest in additional outreach and education efforts.

### Attract More Visitors to Use the Bus

In 2023, 9.8 million visitors came to Spokane County,[14] which represents a major opportunity for STA to attract more riders and support the regional economy. Partnering with Visit Spokane, hotels, and event organizers, we will improve and increase the sharing of information on how to use the bus geared towards tourists and visitors, along with programs to incentivize ridership. For example, we will work with event organizers and venues to integrate transit fare into event tickets, a successful practice used in other cities.

### Increase Engagement with Underrepresented Communities

Through the *Connect 2035* process we have built and deepened relationships with many CBOs and the perspectives we have heard through these partnerships has been invaluable to the process. Going forward, we will formalize these partnerships and practices by establishing a CBO Network to support and strengthen our engagement efforts with underrepresented communities.

*Throughout the Connect 2035 planning process, STA conducted **20 meetings, interviews, and listening sessions with CBOs to gather input and ideas from communities that have been historically underrepresented**, including African American residents, Spanish speakers, new arrivals to the Spokane region, the Asian American and Pacific Islander community, youth, people with disabilities, and the LGBTQ+ community.*

### *Case Study: Climate Pledge Arena, Seattle, Washington*[13]

*The transit partnership associated with Seattle's Climate Pledge Arena is part of a broader effort to promote sustainable transportation and reduce the environmental impact of events at the venue. Climate Pledge Arena, which opened in 2021 and is home to the NHL's Seattle Kraken, the WNBA's Seattle Storm, and various concerts and events, aims to be the world's first carbon-zero arena.*

*One of the core features of the partnership is that **all event tickets for Climate Pledge Arena include free public transit**. This initiative is part of a collaboration between the arena, the Seattle Kraken, and Sound Transit (the regional light rail and bus service provider), as well as King County Metro, which operates buses in the area. This offer applies to both bus and light rail services on event days, encouraging attendees to use public transit instead of driving.*

### *Case Study: LA Metro CBO Network*[15]

*To meet the goals of the Vision 2028 Strategic Plan, LA Metro intends to further collaborations with CBOs and equitably meet community needs. In 2021, TransitCenter and the Center for Neighborhood Technology helped develop a database connecting CBOs and LA Metro staff to each other in order to facilitate potential partnership opportunities.*

*Now, the LA Metro CBO Network serves as a centralized database for Metro departments to identify local organizations for project collaborations. The site provides users with profile information on organizations and partnership opportunities with Metro. Overall, The LA Metro CBO Network is designed to ensure that the CBOs Metro engages with will more accurately reflect the County's diverse communities and promote equitable strategies by strengthening partnerships with CBOs where Metro operates.*

# **Goal 3:** Strengthen Our Capacity

As an organization, STA must grow and adapt to ever changing conditions and respond to the demands of the region. Having a team who is well equipped and focused on our mission, along with strong supporting infrastructure, will provide the foundation required to deliver on the goals of this plan, balanced with providing reliable daily service. Using our existing resources, STA will pursue the following projects and investments.

### Improve Real-Time Information

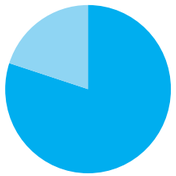
We know that riders value access to real-time information about when the next bus is arriving and count on that information to be accurate. In order to continually improve the reliability of real-time information, we will upgrade our backend technology systems to enable better, more accurate information for our riders.

### Invest in Our Operators

STA has made significant investments over the last several years to hire and retain more bus operators. Looking forward, we are committed to investing in our operators and improve their day-to-day experience by upgrading break rooms and amenities, delivering more high-quality restrooms along routes, and developing new operator support systems.

**80%**

of STA riders say that bus operators are knowledgeable, courteous, and helpful—significantly higher than the national average.[16]



### Streamline Customer Interactions and Service Delivery

At STA, we pride ourselves on our customer service and continually work to make it easier for riders to get the information they need quickly and easily. Investing in new technology solutions will enable our customer service teams to better track, respond to, and resolve customer inquiries and improve collaboration for teams across STA. The results for our customers: smoother, faster resolution for inquiries and issues.

### Safer Vehicles

STA has begun gathering more information from vehicles on driver behavior and vehicle condition to improve safety, inform preventative maintenance, and create new opportunities for operator training. In the coming years, we will continue these investments to cover our entire fleet of vehicles.

### Increase Transparency and Access to Data

We know that reporting on our performance and making data publicly available are critical to building trust with our communities. As part of *Connect 2035*, we will develop user-friendly public dashboards for key performance indicators and make it easier to access and use transit data.

### Build Our Team

At STA, we invest in our people and work to build a diverse, inclusive, and empowered workforce that takes pride in serving our region. To support this work, we will establish an organizational development program to formalize training, leadership development, and enhance employee engagement and internal communications across the organization.

# Future Service Improvements

Throughout the *Connect 2035* planning process, we heard many ideas for future projects and investments. Many of these ideas are tied to increasing transit service—either running buses later or more often on existing routes, or creating new routes to serve growing parts of the region.

Delivering these future improvements will require additional, ongoing funding sources, so that STA can sustainably grow service without compromising any of the investments of the past decade. Extending our current levels of sales tax funding, which requires voter approval before 2028, will enable STA to maintain past investments and deliver the package of projects and investments highlighted in the preceding pages; however, it would not provide additional funding needed to continue expanding the system. A new funding source, such as increasing the transit sales tax rate to 0.9% (or an additional 0.1%), is necessary to enable continued growth of the system and major service increases.

These potential future investments are organized around two key themes:

### Service Frequency and Extensions

**Increase weekend service frequency** on additional high-performing routes.

**Extend bus service to 12:30 a.m. Monday to Saturday**.

**Increase service frequency in the West Plains.**

**Make Mobility-on-Demand pilots permanent** to provide transit service to growing areas.

### High Performance Transit

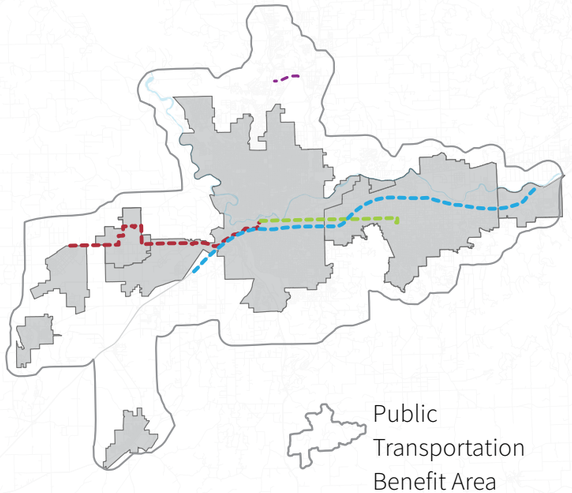
**Upgrade Route 61 - Highway 2/Fairchild** to HPT (upgraded stations and amenities and increased frequency).

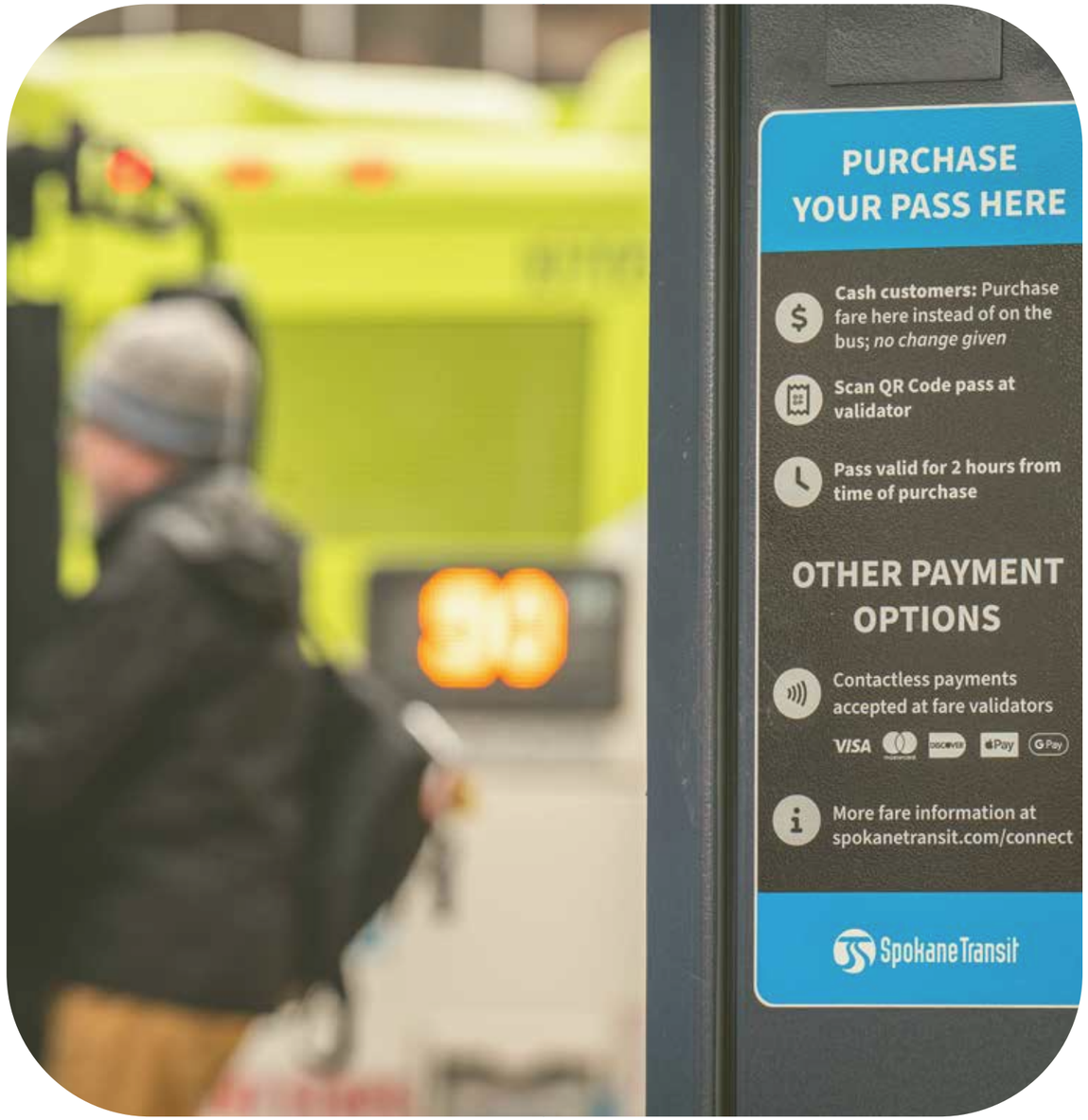
**Extend Route 9 - Sprague** to Liberty Lake (upgraded stations and amenities and increased frequency).

**Expand High Performance Transit** investments in the I-90 corridor between Liberty Lake and the Airport to include more frequency and additional connections.

**Upgrade the planned Division Street Bus Rapid Transit line** to 10-minute service and extend the line to Mead from Hastings Park and Ride.

### Future High Performance Transit Lines



# 7.0 APPENDIX

## II. INVENTORY

### SUPPLEMENTAL INFORMATION

# INVENTORY
## BOONE SOUTH

### BUILDING CONDITION EVALUATION FORM

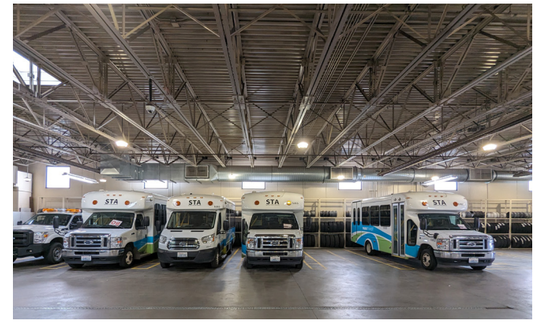
Spokane Transit Authority — Owner
Boone South — Facility Name

| COMPONENTS | SYSTEMS | RATINGS GOOD (1) | FAIR (2) | POOR (3) | UNSAT. (4) | COMBINED | COMMENTS |
|---|---|---|---|---|---|---|---|
| **1.0 Building Condition** | 1.1 Foundation/Structure | +10 | **+8** | +6 | +4 | **+8** | Slab cracking. Roof joists have had i items hung or added over the years and are unlikely to have reserve capacity for additional load modifications (likely no capacity for solar). |
| | 1.2 Walls/Trim | +5 | **+3** | +2 | +1 | **+3** | Replace/repair sealant between wall panels. |
| **+18** Component Score | 1.3 Roof | +5 | **+3** | +2 | +0 | **+3** | Structurally, roof likely does not have capacity to support future solar. |
| | 1.4 Windows/Doors | +2 | **+1** | +0 | +0 | **+1** | Most windows are original and underperform today's. |
| | 1.5 Floors/Ceilings | +2 | **+1** | +0 | +0 | **+1** | Paint peeling/flaking from underside of roof deck in places, slab cracking. Finishes are primarily in good, but aged condition |
| | 1.9 Fixed Equipment | **+2** | +1 | +0 | +0 | **+2** | |
| | | | | | | | |
| **2.0 Mechanical Systems Condition** | 2.1 Plumbing | +4 | **+2** | +1 | +0 | **+2** | |
| **+12** Component Score | 2.2 Heating | +6 | **+4** | +2 | +1 | **+4** | |
| | 2.3 Cooling | +6 | **+4** | +2 | +1 | **+4** | |
| | 2.4 Gas/Water Services | +4 | **+2** | +1 | +0 | **+2** | |
| | | | | | | | |
| **3.0 Electrical Systems Condition** | 3.1 Electrical Equipment | **+6** | +4 | +2 | +1 | **+6** | Rating reflects current elec upgrade projects |
| | 3.2 Electrical Capacity | +6 | **+4** | +2 | +0 | **+4** | Future flexibility limited to primarily diesel bus services. |
| **+14** Component Score | 3.3 Lighting | +3 | **+2** | +1 | +0 | **+2** | No visible issues |
| | 3.4 Emergency Power | +6 | +4 | **+2** | +1 | **+2** | No space for future expansion, exiisting generators not sized for bus charging |
| | 3.5 Chargers | +6 | +4 | +1 | **+0** | **+0** | No bus chargers, no appropriate battery storage |
| | | | | | | | |
| **4.0 Fire Protection/Safety/Code** | 4.1 Means of Egress | +4 | +2 | **+1** | +0 | **+1** | Existing stairs will limit options for assembly on Level 2. |
| | 4.2 Fire Control Capability | +10 | +6 | +2 | **+0** | **+0** | Sprinkler system does not appear to be designed for high-piled storage, tire storage, nor electric vehicles |
| **+3** Component Score | 4.3 Fire Alarm System | +3 | +2 | +1 | **+0** | **+0** | Obsolete system with improper coverage of notification appliances. |
| | 4.4 Emergency Lighting | +2 | **+1** | +0 | +0 | **+1** | |
| | 4.5 Fire Resistance | +4 | +3 | +2 | **+1** | **+1** | Needds FDS modeling to determine compatibility with Evs |
| | 4.6 Code Compliance | +4 | +3 | +2 | **+0** | **+0** | See section 4.2 above |
| | | GOOD | FAIR | POOR | UNSAT. | | |
| | Category Scores | +100 | +64 | +32 | +10 | | |
| | **Facility Combined Score** | | | | | **+47** | |
| **5.0 Accessibility** | | | | | | | |
| **6.0 Vehicle Door Heights** | Adequte for urban bus and Paratransit vans, accommodation can be made to facilitate double decker buses, though not at every door. | | | | | | |
| | | | | | | | |
| | | | | | | | |
| **Suitability Code and Definition** | *1 Building makes positive contribution and flexible towards long term objectives and functionality.* | | | | | | |
| | *2 Building suitable for current use and provides some flexibility towards expansion / remodel.* | | | | | | |
| | ***3 Current use of space is compatible with intended use but needs upgrades and limited flexibility towards expansion / remodel.*** | | | | | | |
| | *4 Current use of space is not compatible with intended use or no ability to meet master plan use.* | | | | | | |

| | Date | Unadjusted Score | Adjusted Score |
|---|---|---|---|
| | **3/28/2025** | **+47** | **50** |



# INVENTORY
## BOONE NORTH



### BUILDING CONDITION EVALUATION FORM

Spokane Transit Authority — Owner
Boone North — Facility Name

| COMPONENTS | SYSTEMS | RATINGS GOOD (1) | FAIR (2) | POOR (3) | UNSAT. (4) | COMBINED | COMMENTS |
|---|---|---|---|---|---|---|---|
| **1.0 Building Condition** | 1.1 Foundation/Structure | +10 | **+8** | +6 | +4 | **+8** | Slab cracking. No visible structural concerns or issues. Settlement documented in sky bridge. |
| | 1.2 Walls/Trim | +5 | **+3** | +2 | +1 | **+3** | Repair / replace sealant |
| **+18** Component Score | 1.3 Roof | +5 | **+3** | +2 | +0 | **+3** | Because the roof is OWSJ, it is unlikely the roof would have the capacity for future solar panels. |
| | 1.4 Windows/Doors | **+2** | +1 | +0 | +0 | **+2** | |
| | 1.5 Floors/Ceilings | +2 | **+1** | +0 | +0 | **+1** | Finishes are primarily in good, but aged condition |
| | 1.9 Fixed Equipment | +2 | **+1** | +0 | +0 | **+1** | |
| | | | | | | | |
| **2.0 Mechanical Systems Condition** | 2.1 Plumbing | +4 | +2 | **+1** | +0 | **+2** | |
| **+12** Component Score | 2.2 Heating | +6 | **+4** | +2 | +1 | **+4** | |
| | 2.3 Cooling | +6 | **+4** | +2 | +1 | **+4** | |
| | 2.4 Gas/Water Services | +4 | **+2** | +1 | +0 | **+2** | |
| | | | | | | | |
| **3.0 Electrical Systems Condition** | 3.1 Electrical Equipment | **+6** | +4 | +2 | +1 | **+6** | Rating reflects current elec upgrade projects |
| | 3.2 Electrical Capacity | +6 | **+4** | +2 | +0 | **+4** | Flexibility limited by space in bldg |
| **+18** Component Score | 3.3 Lighting | +3 | **+2** | +1 | +0 | **+2** | No visible issues |
| | 3.4 Emergency Power | **+6** | +4 | +2 | +1 | **+6** | Plenty of exterior space to expand generator |
| | 3.5 Chargers | +6 | +4 | +1 | **+0** | **+0** | No bus chargers, no appropriate battery storage |
| | | | | | | | |
| **4.0 Fire Protection/Safety/Code** | 4.1 Means of Egress | +4 | **+2** | +1 | +0 | **+2** | North Stair did not appear to be enclosed with 1FB |
| | 4.2 Fire Control Capability | +10 | +6 | **+2** | +0 | **+2** | Sprinkler system does not appear to be designed for any future Evs |
| **+8** Component Score | 4.3 Fire Alarm System | +3 | +2 | +1 | **+0** | **+0** | Obsolete system; connects to South building |
| | 4.4 Emergency Lighting | +2 | **+1** | +0 | +0 | **+1** | |
| | 4.5 Fire Resistance | +4 | +3 | +2 | **+1** | **+1** | Needs FDS modeling to determine compatibility with any future Evs |
| | 4.6 Code Compliance | +4 | +3 | **+2** | +0 | **+2** | |
| | | GOOD | FAIR | POOR | UNSAT. | | |
| | Category Scores | +100 | +64 | +32 | +10 | | |
| | **Facility Combined Score** | | | | | **+56** | |
| **5.0 Accessibility** | | | | | | | |
| **6.0 Vehicle Door Heights** | Adequte for Paratransit bus and vans | | | | | | |
| | All doors approximately 11.5' | | | | | | |
| | | | | | | | |
| **Suitability Code and Definition** | *1 Building makes positive contribution and flexible towards long term objectives and functionality.* | | | | | | |
| | *2 Building suitable for current use and provides some flexibility towards expansion / remodel.* | | | | | | |
| | **3 Current use of space is compatible with intended use but needs upgrades and limited flexibility towards expansion / remodel.** | | | | | | |
| | *4 Current use of space is not compatible with intended use or no ability to meet master plan use.* | | | | | | |

| | Date | Unadjusted Score | Adjusted Score |
|---|---|---|---|
| | | **+56** | **60** |

# INVENTORY
## BOONE NORTHWEST GARAGE


### BUILDING CONDITION EVALUATION FORM

Spokane Transit Authority — Owner
Boone NW Garage — Facility Name

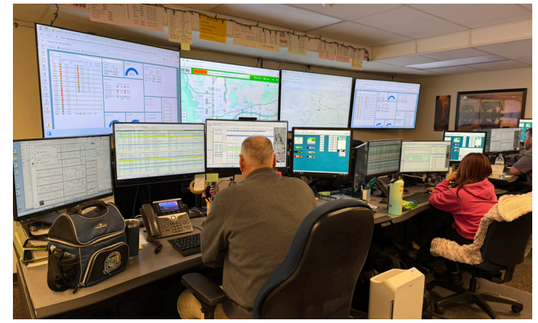
| COMPONENTS | SYSTEMS | RATINGS GOOD (1) | FAIR (2) | POOR (3) | UNSAT. (4) | COMBINED | COMMENTS |
|---|---|---|---|---|---|---|---|
| **1.0 Building Condition** | 1.1 Foundation/Structure | **+10** | +8 | +6 | +4 | **+10** | Building constructed in 2018, in excellent condition. Design allowed for 15 PSF of collateral (superimposed) dead load so joists/PEMB has reservce structural capacity. |
| | 1.2 Walls/Trim | **+5** | +3 | +2 | +1 | **+5** | No visible deficiencies. |
| **+26** Component Score | 1.3 Roof | **+5** | +3 | +2 | +0 | **+5** | No visible or known deficiencies. Has reserve capacity for solar or roof and/or additional ceiling hung equipment. |
| | 1.4 Windows/Doors | **+2** | +1 | +0 | +0 | **+2** | |
| | 1.5 Floors/Ceilings | **+2** | +1 | +0 | +0 | **+2** | |
| | 1.9 Fixed Equipment | **+2** | +1 | +0 | +0 | **+2** | |
| | | | | | | | |
| **2.0 Mechanical Systems Condition** | 2.1 Plumbing | **+4** | +2 | +1 | +0 | **+4** | |
| **+20** Component Score | 2.2 Heating | **+6** | +4 | +2 | +1 | **+6** | |
| | 2.3 Cooling | **+6** | +4 | +2 | +1 | **+6** | |
| | 2.4 Gas/Water Services | **+4** | +2 | +1 | +0 | **+4** | |
| | | | | | | | |
| **3.0 Electrical Systems Condition** | 3.1 Electrical Equipment | **+6** | +4 | +2 | +1 | **+6** | |
| | 3.2 Electrical Capacity | **+6** | +4 | +2 | +0 | **+6** | |
| **+27** Component Score | 3.3 Lighting | **+3** | +2 | +1 | +0 | **+3** | |
| | 3.4 Emergency Power | **+6** | +4 | +2 | +1 | **+6** | |
| | 3.5 Chargers | **+6** | +4 | +1 | +0 | **+6** | |
| | | | | | | | |
| **4.0 Fire Protection/Safety/Code** | 4.1 Means of Egress | **+4** | +2 | +1 | +0 | **+4** | |
| | 4.2 Fire Control Capability | +10 | +6 | +2 | **+0** | **+0** | Sprinkler system does not appear to be designed for electric vehicle |
| **+13** Component Score | 4.3 Fire Alarm System | +3 | **+2** | +1 | +0 | **+2** | |
| | 4.4 Emergency Lighting | **+2** | +1 | +0 | +0 | **+2** | |
| | 4.5 Fire Resistance | +4 | +3 | +2 | **+1** | **+1** | Needs FDS modeling to determine compatability with EVs |
| | 4.6 Code Compliance | **+4** | +3 | +2 | +0 | **+4** | |
| | | GOOD | FAIR | POOR | UNSAT. | | |
| | Category Scores | +100 | +64 | +32 | +10 | | |
| | **Facility Combined Score** | | | | | **+86** | |
| **5.0 Accessibility** | | | | | | | |
| **6.0 Vehicle Door Heights** | All doors adequate to accommodate double decker bus | | | | | | |

| Suitability Code and Definition |
|---|
| ***1 Building makes positive contribution and flexible towards long term objectives and functionality.*** |
| *2 Building suitable for current use and provides some flexibility towards expansion / remodel.* |
| *3 Current use of space is compatible with intended use but needs upgrades and limited flexibility towards expansion / remodel.* |
| *4 Current use of space is not compatible with intended use or no ability to meet master plan use.* |

| Date | Unadjusted Score | Adjusted Score |
|---|---|---|
| | **+86** | **91** |



# INVENTORY
## 1212 SHARP



### BUILDING CONDITION EVALUATION FORM

Spokane Transit Authority — Owner
1212 Sharp — Facility Name

| COMPONENTS | SYSTEMS | RATINGS GOOD (1) | FAIR (2) | POOR (3) | UNSAT. (4) | COMBINED | COMMENTS |
|---|---|---|---|---|---|---|---|
| **1.0 Building Condition** | 1.1 Foundation/Structure | +10 | +8 | **+6** | +4 | **+6** | Structure not visible and could not be reviewed. There were no visible signs of structural deficiencies. Floors were bouncy and had squeaks which is to be expected for age and type of construction. Floors are likely designed for residential loading. |
| | 1.2 Walls/Trim | +5 | +3 | **+2** | +1 | **+2** | Exterior wall where deck was removed needs weather protected/sealed. Some interior drywall cracking. Peeling paint on exterior trim. |
| **+12** Component Score | 1.3 Roof | +5 | +3 | **+2** | +0 | **+2** | Roof structure/capacity unknown and would need evaluated prior to addition of any solar panels. |
| | 1.4 Windows/Doors | +2 | +1 | **+0** | +0 | **+0** | |
| | 1.5 Floors/Ceilings | +2 | **+1** | +0 | +0 | **+1** | |
| | 1.9 Fixed Equipment | +2 | **+1** | +0 | +0 | **+1** | |
| | | | | | | | |
| **2.0 Mechanical Systems Condition** | 2.1 Plumbing | +4 | **+2** | +1 | +0 | **+2** | |
| **+10** Component Score | 2.2 Heating | +6 | +4 | **+2** | +1 | **+2** | Older RTUs ready for replacement |
| | 2.3 Cooling | +6 | **+4** | +2 | +1 | **+4** | Newer AC in dispatch, older RTUs |
| | 2.4 Gas/Water Services | +4 | **+2** | +1 | +0 | **+2** | |
| | | | | | | | |
| **3.0 Electrical Systems Condition** | 3.1 Electrical Equipment | +6 | +4 | **+2** | +1 | **+2** | |
| | 3.2 Electrical Capacity | +6 | +4 | **+2** | +0 | **+2** | |
| **+8** Component Score | 3.3 Lighting | +3 | +2 | **+1** | +0 | **+1** | |
| | 3.4 Emergency Power | +6 | +4 | **+2** | +1 | **+2** | |
| | 3.5 Chargers | +6 | +4 | **+1** | +0 | **+1** | |
| | | | | | | | |
| **4.0 Fire Protection/Safety/Code** | 4.1 Means of Egress | +4 | +2 | +1 | **+0** | **+0** | Does not appear to meet ADA or provide area of refuge |
| | 4.2 Fire Control Capability | +10 | +6 | +2 | +0 | **N/A** | |
| **+2** Component Score | 4.3 Fire Alarm System | +3 | +2 | +1 | +0 | **N/A** | |
| | 4.4 Emergency Lighting | +2 | +1 | **+0** | +0 | **+0** | |
| | 4.5 Fire Resistance | +4 | +3 | +2 | +1 | **N/A** | |
| | 4.6 Code Compliance | +4 | +3 | **+2** | +0 | **+2** | |
| | | GOOD | FAIR | POOR | UNSAT. | | |
| | Category Scores | +100 | +64 | +32 | +10 | | |
| | **Facility Combined Score** | | | | | **+32** | |
| **5.0 Accessibility** | | | | **X** | | | Lower level is not ADA accessible. |
| **6.0 Vehicle Door Heights** | NA | | | | | | |

| Suitability Code and Definition |
|---|
| *1 Building makes positive contribution and flexible towards long term objectives and functionality.* |
| *2 Building suitable for current use and provides some flexibility towards expansion / remodel.* |
| **3 Current use of space is compatible with intended use but needs upgrades and limited flexibility towards expansion / remodel.** |
| *4 Current use of space is not compatible with intended use or no ability to meet master plan use.* |

| Date | Unadjusted Score | Adjusted Score |
|---|---|---|
| | **+32** | **34** |

# INVENTORY
## FLECK (VALLEY SERVICE CENTER)

### BUILDING CONDITION EVALUATION FORM

Spokane Transit Authority — Owner
Fleck Service Center — Facility Name

| COMPONENTS | SYSTEMS | RATINGS GOOD (1) | FAIR (2) | POOR (3) | UNSAT. (4) | COMBINED | COMMENTS |
|---|---|---|---|---|---|---|---|
| **1.0 Building Condition** | 1.1 Foundation/Structure | +10 | +8 | **+6** | +4 | **+6** | Roof double T cracks, bearing wall hairline vertical cracks on interior side of wall, slabs cracking. Wall cracks are likely shrinkage/temperature related. Cracks in bus wash bay walls should be sealed to prevent further deterioration. |
| | 1.2 Walls/Trim | **+5** | +3 | +2 | +1 | **+5** | Vertical wall cracking at interior walls and interior side of exterior walls (hairline for the most part). Hairline cracking at exterior column between garage doors. |
| +19 Component Score | 1.3 Roof | +5 | **+3** | +2 | +0 | **+3** | Roof replaced 2016. Some cracking in precast double T joistss. Capacity of roof would need evaluated structurally prior to any new loading such as solar. |
| | 1.4 Windows/Doors | +2 | **+1** | +0 | +0 | **+1** | HM Corrosion |
| | 1.5 Floors/Ceilings | **+2** | +1 | +0 | +0 | **+2** | |
| | 1.9 Fixed Equipment | **+2** | +1 | +0 | +0 | **+2** | Bus Wash and Fuel Tank Projects Completed 2025 |
| **2.0 Mechanical Systems Condition** | 2.1 Plumbing | **+4** | +2 | +1 | +0 | **+2** | Plumbing fair condition, need new oil interceptor |
| +16 Component Score | 2.2 Heating | **+6** | +4 | +2 | +1 | **+6** | Newer HVAC, existing radient heating |
| | 2.3 Cooling | +8 | **+4** | +2 | +1 | **+4** | Cooling sufficient for ongoing maintenance |
| | 2.4 Gas/Water Services | **+4** | +2 | +1 | +0 | **+4** | |
| **3.0 Electrical Systems Condition** | 3.1 Electrical Equipment | +6 | +4 | **+2** | +1 | **+2** | Main SWBD Limited |
| | 3.2 Electrical Capacity | +8 | **+4** | +2 | +0 | **+4** | |
| +12 Component Score | 3.3 Lighting | +3 | **+2** | +1 | +0 | **+2** | No visible issues |
| | 3.4 Emergency Power | +6 | **+4** | +2 | +1 | **+4** | |
| | 3.5 Chargers | +6 | +4 | +1 | **+0** | **+0** | No chargers, no appropriate battery storage |
| **4.0 Fire Protection/Safety/Code** | 4.1 Means of Egress | +4 | **+2** | +1 | +0 | **+2** | |
| | 4.2 Fire Control Capability | +10 | +6 | **+2** | +0 | **+2** | |
| +10 Component Score | 4.3 Fire Alarm System | +3 | +2 | **+1** | +0 | **+1** | |
| | 4.4 Emergency Lighting | +2 | **+1** | +0 | +0 | **+1** | |
| | 4.5 Fire Resistance | +4 | +3 | **+2** | +1 | **+2** | Needs FDS modeling to determine compatability with Evs |
| | 4.6 Code Compliance | +4 | +3 | **+2** | +0 | **+2** | |
| | | GOOD | FAIR | POOR | UNSAT. | | |
| | Category Scores | +100 | +64 | +32 | +10 | | |
| | **Facility Combined Score** | | | | | **+57** | |
| **5.0 Accessibility** | | | **X** | | | | No accessible toilet or urinal |
| **6.0 Vehicle Door Heights** | Adequate for urban bus and Paratransit vans | | | | | | |
| | North doors (3 on East side and 3 on West side) 14'; South doors (5 on East side and 5 on West side) 12' | | | | | | |

**Suitability Code and Definition**

*1 Building makes positive contribution and flexible towards long term objectives and functionality.*
**2 Building suitable for current use and provides some flexibility towards expansion / remodel.**
*3 Current use of space is compatible with intended use but needs upgrades and limited flexibility towards expansion / remodel.*
*4 Current use of space is not compatible with intended use or no ability to meet master plan use.*

| Date | Unadjusted Score | Adjusted Score |
|---|---|---|
| | +57 | 61 |



# INVENTORY
## DOWNTOWN PLAZA


### BUILDING CONDITION EVALUATION FORM

Spokane Transit Authority — Owner
Downtown Plaza — Facility Name

| COMPONENTS | SYSTEMS | RATINGS GOOD (1) | FAIR (2) | POOR (3) | UNSAT. (4) | COMBINED | COMMENTS |
|---|---|---|---|---|---|---|---|
| **1.0 Building Condition** | 1.1 Foundation/Structure | **+10** | +8 | +6 | +4 | **+10** | Structure is in good condition, renovated in 2016-17 |
| | 1.2 Walls/Trim | **+5** | +3 | +2 | +1 | **+5** | Hairline cracking in concrete walls in parking level ramp/basement walls. |
| +26 Component Score | 1.3 Roof | **+5** | +3 | +2 | +0 | **+5** | Roof framing is WF beams so these may have some residual capacity and/or could be reinforced if needed to add capacity for solar panels on the roof. Roof about 15 years old |
| | 1.4 Windows/Doors | **+2** | +1 | +0 | +0 | **+2** | |
| | 1.5 Floors/Ceilings | **+2** | +1 | +0 | +0 | **+2** | |
| | 1.9 Fixed Equipment | **+2** | +1 | +0 | +0 | **+2** | |
| | | | | | | | |
| **2.0 Mechanical Systems Condition** | 2.1 Plumbing | **+4** | +2 | +1 | +0 | **+4** | Fair condition and accessibile remodeling |
| +14 Component Score | 2.2 Heating | +6 | +4 | **+2** | +1 | **+2** | Equipment old and inefficient |
| | 2.3 Cooling | +6 | **+4** | +2 | +1 | **+4** | HVAC old and inefficient, newer cooling towers |
| | 2.4 Gas/Water Services | **+4** | +2 | +1 | +0 | **+4** | Infrastructure in fair condition |
| | | | | | | | |
| **3.0 Electrical Systems Condition** | 3.1 Electrical Equipment | **+6** | +4 | +2 | +1 | **+6** | Main SWBD Limited |
| | 3.2 Electrical Capacity | +8 | +4 | **+2** | +0 | **+2** | |
| +14 Component Score | 3.3 Lighting | **+3** | +2 | +1 | +0 | **+3** | |
| | 3.4 Emergency Power | +6 | +4 | **+2** | +1 | **+2** | |
| | 3.5 Chargers | +6 | +4 | **+1** | +0 | **+1** | No chargers |
| | | | | | | | |
| **4.0 Fire Protection/Safety/Code** | 4.1 Means of Egress | **+4** | +2 | +1 | +0 | **+4** | |
| | 4.2 Fire Control Capability | **+10** | +6 | +2 | +0 | **+10** | |
| +26 Component Score | 4.3 Fire Alarm System | +3 | **+2** | +1 | +0 | **+2** | |
| | 4.4 Emergency Lighting | **+2** | +1 | +0 | +0 | **+2** | |
| | 4.5 Fire Resistance | **+4** | +3 | +2 | +1 | **+4** | |
| | 4.6 Code Compliance | **+4** | +3 | +2 | +0 | **+4** | |
| | | GOOD | FAIR | POOR | UNSAT. | | |
| | Category Scores | +100 | +64 | +32 | +10 | | |
| | **Facility Combined Score** | | | | | **+80** | |
| **5.0 Accessibility** | | **X** | | | | | |
| **6.0 Vehicle Door Heights** | NA | | | | | | |

**Suitability Code and Definition**

*1 Building makes positive contribution and flexible towards long term objectives and functionality.*
**2 Building suitable for current use and provides some flexibility towards expansion / remodel.**
*3 Current use of space is compatible with intended use but needs upgrades and limited flexibility towards expansion / remodel.*
*4 Current use of space is not compatible with intended use or no ability to meet master plan use.*

Significant Location Factors/Overall Conclusions

| Date | Unadjusted Score | Adjusted Score |
|---|---|---|
| | +80 | 85 |

# INVENTORY
## VISIONING

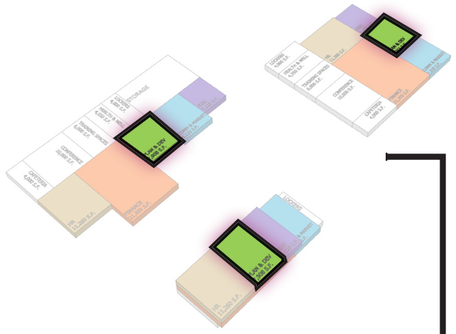
### Collectively Identified Ideals

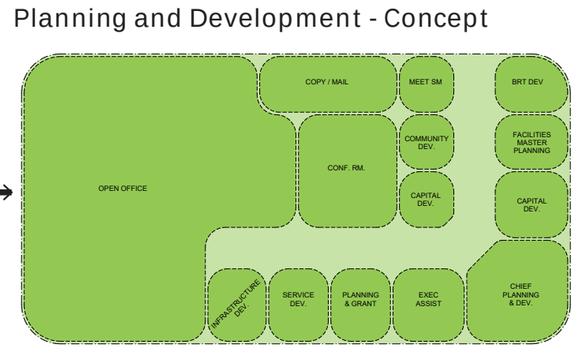
- Clean Energy Campus / Base
- Dedicated training spaces (center?)
- Increased parking and vehicle storage space, separation between parking for employee and any STA vehicles
- Meeting and collaboration space
- Many small flex spaces
- Large, singular break / lunch area for all employees
- Dedicated lactation spaces
- Celebrate physical fitness space
- Increased daylighting and updated aesthetics

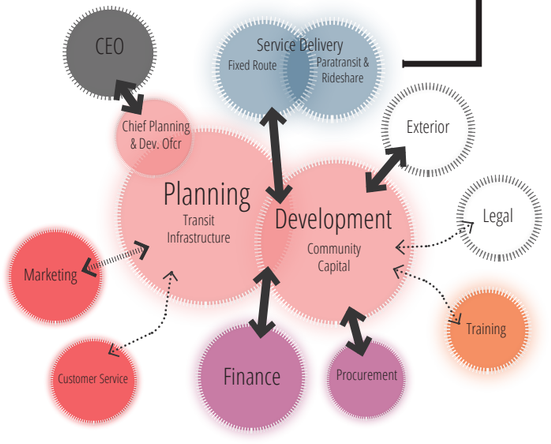


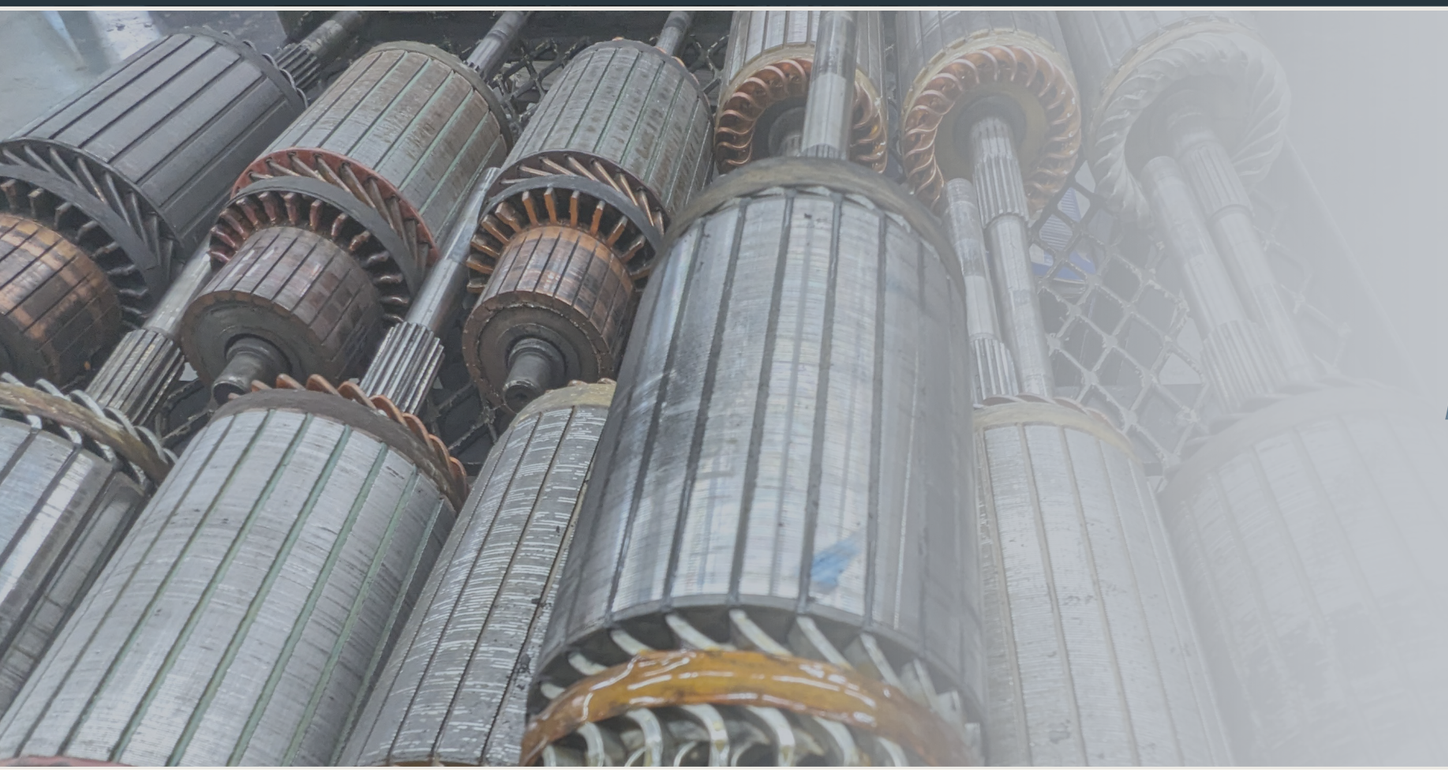


# INVENTORY
## PROGRAM





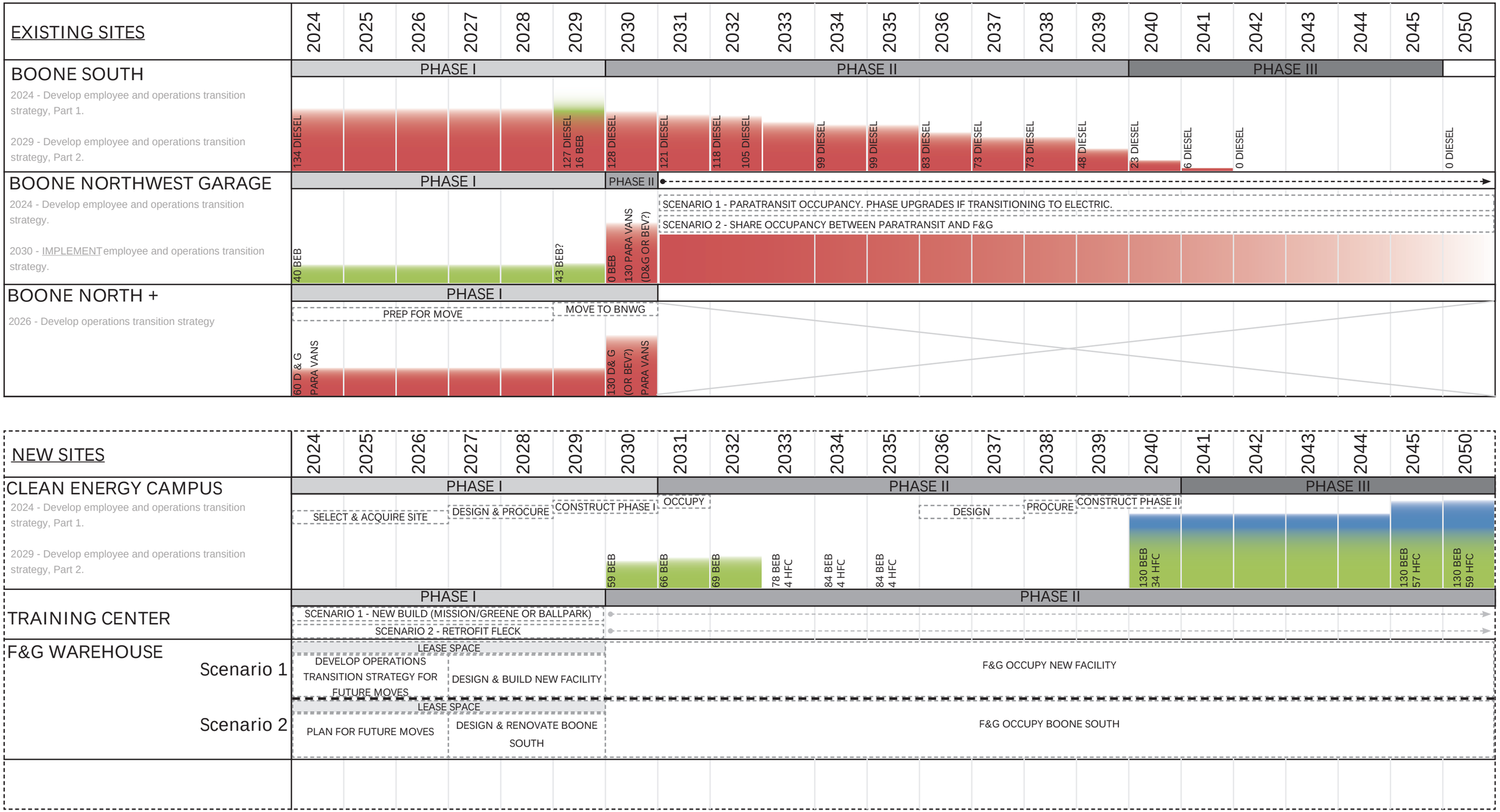


# 7.0 APPENDIX

## III. CURRENT OPERATIONS ANALYSIS & NEEDS PROGRAMMING

### SUPPLEMENTAL INFORMATION

# CURRENT OPERATIONS ANALYSIS & NEEDS PROGRAMMING
## TRANSITION TO ZERO EMISSIONS






COFFMAN ENGINEERS

# DECARBONIZATION TECHNOLOGIES

**Spokane Transit Authority**

May 2025

**Prepared By: Coffman Engineers**
221 N. Wall Street, #500 | Spokane, WA 99201 | 509.328.2994
www.coffman.com


# EXECUTIVE SUMMARY



Spokane Transit Authority (STA) will transition its fleet to 100% zero-emission buses (ZEBs) by 2045, in accordance with state mandates requiring transit agencies to transition their vehicles as practicable. STA also has an opportunity to reduce carbon emissions by increasing the deployment of renewable and alternative energy technologies, hydrogen, and other emerging technologies. There are several viable technologies that can be used to decarbonize STA while also supporting the fleet transition to ZEBs and providing facility sustainability and resilience.

The technologies outlined in this document are either well established technologies widely deployed across the US or emerging technologies with new and developing codes. A review is provided for each technology, which also includes considerations for safety & hazards, siting, applicability for the Spokane region and STA, advantages and disadvantages, operation and maintenance needs, and market status/cost considerations.

**TECHNOLOGIES**

- Hydrogen Storage
- Hydrogen Fuel Dispensers
- Hydrogen Hubs & Availability
- Hydrogen Production
- Electric Vehicle Charging Station
- Energy Storage
- Fuel Cells
- Other Non-Diesel Genset Back-up Power Options
- Microgrids
- Photovoltaic (Solar)

This document serves as a guide to the existing established technologies and the potential emerging technologies that can support STA in achieving its decarbonization goals. This assessment aims to enhance the fleet's sustainability, operational resilience, and alignment with state mandates. While the document does not endorse specific technologies for deployment, it offers critical insights into the applicability, safety, and economic considerations for each reviewed technology, helping STA make informed decisions for a greener future.

This Technologies Assessment serves as a high-level reference document on decarbonization technologies for STA's consideration. These technologies will be integrated into the next phase of the Master Plan and Clean Energy Campus once sites have been selected. That phase will involve evaluating the technologies based on site-specific factors, operations, and programming considerations.

# TABLE OF CONTENTS

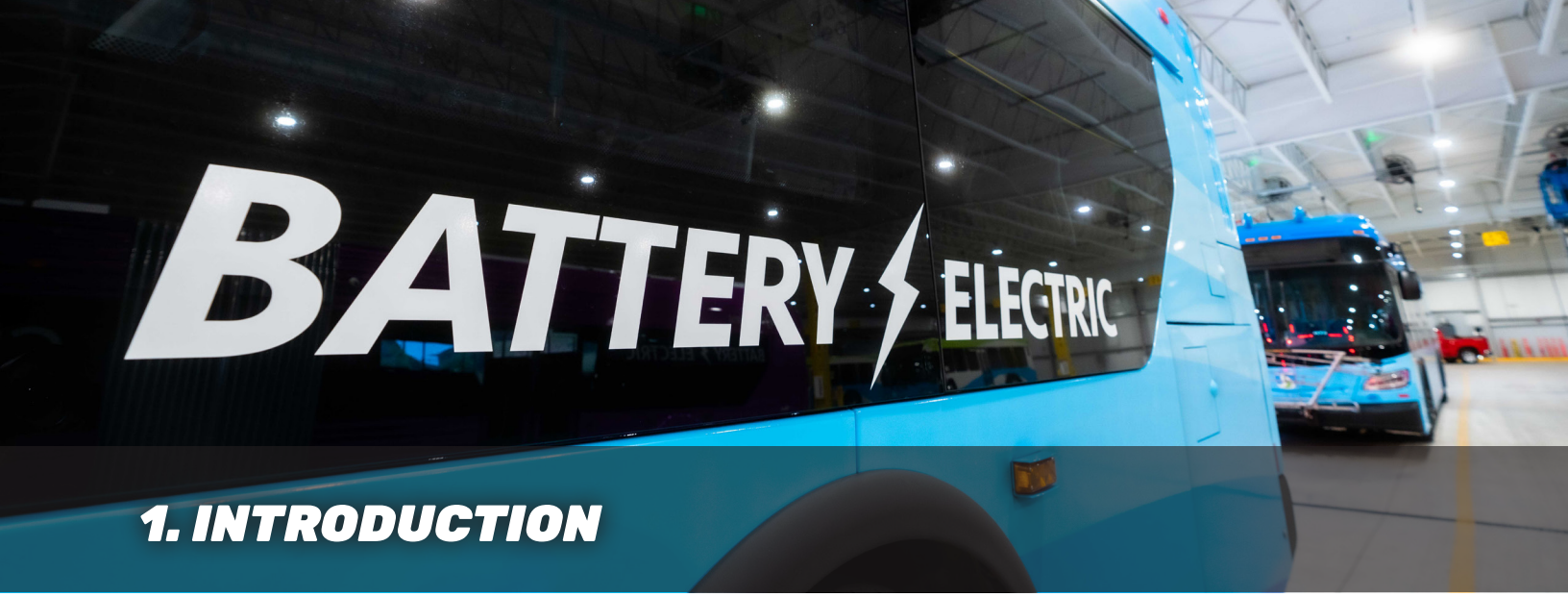


Connect with us on social media.

# 1 Introduction



COFFMAN ENGINEERS



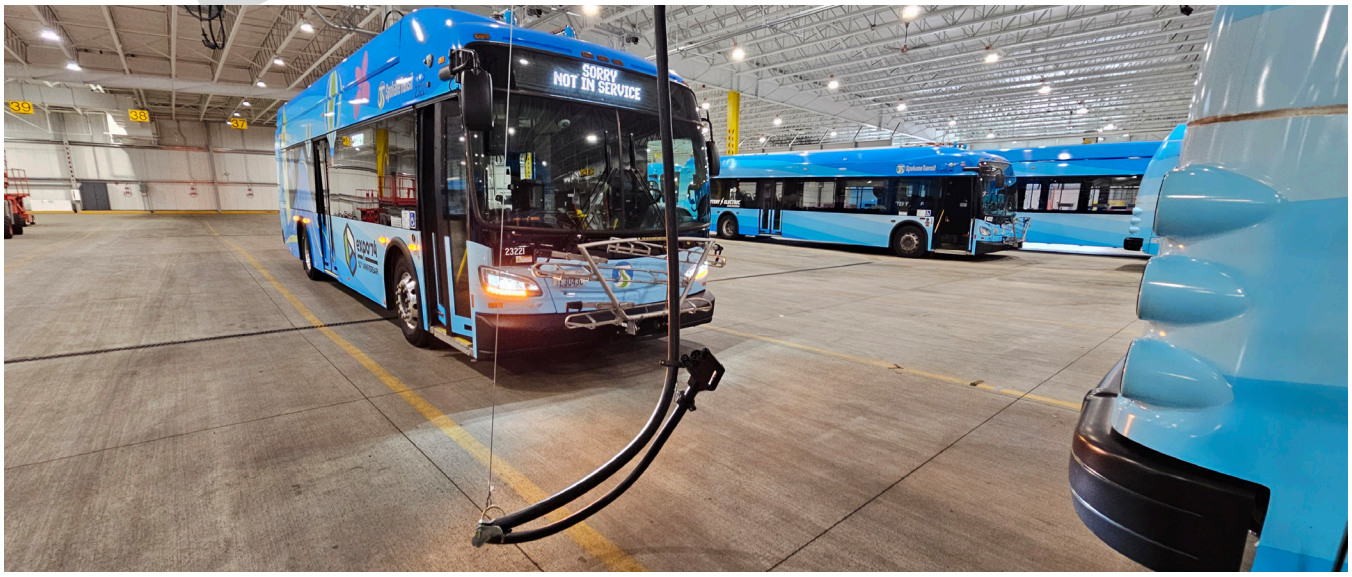

# 1. INTRODUCTION

## INTRODUCTION

Decarbonization has become a large priority across the world due to current and foreseeable policy interventions and regulatory requirements at local, state, and federal levels that impact the viability of maintaining the status quo. Recent Washington State legislation has set regulations for the built environment to support decarbonization for facilities and vehicles. Obtaining Federal and State grants can help with the transition to zero-emissions and aid in minimizing the impact on Spokane tax payers. The ZEB fleet transition will shape the infrastructure needs for STA facilities. As the infrastructure needs for STA evolves, a mixture of renewable and alternative energy technologies can be intergrated to reduce carbon emissions from its facilities' operations while adhering to the state and federal requirements that are now part of the transportation and electrical landscape.

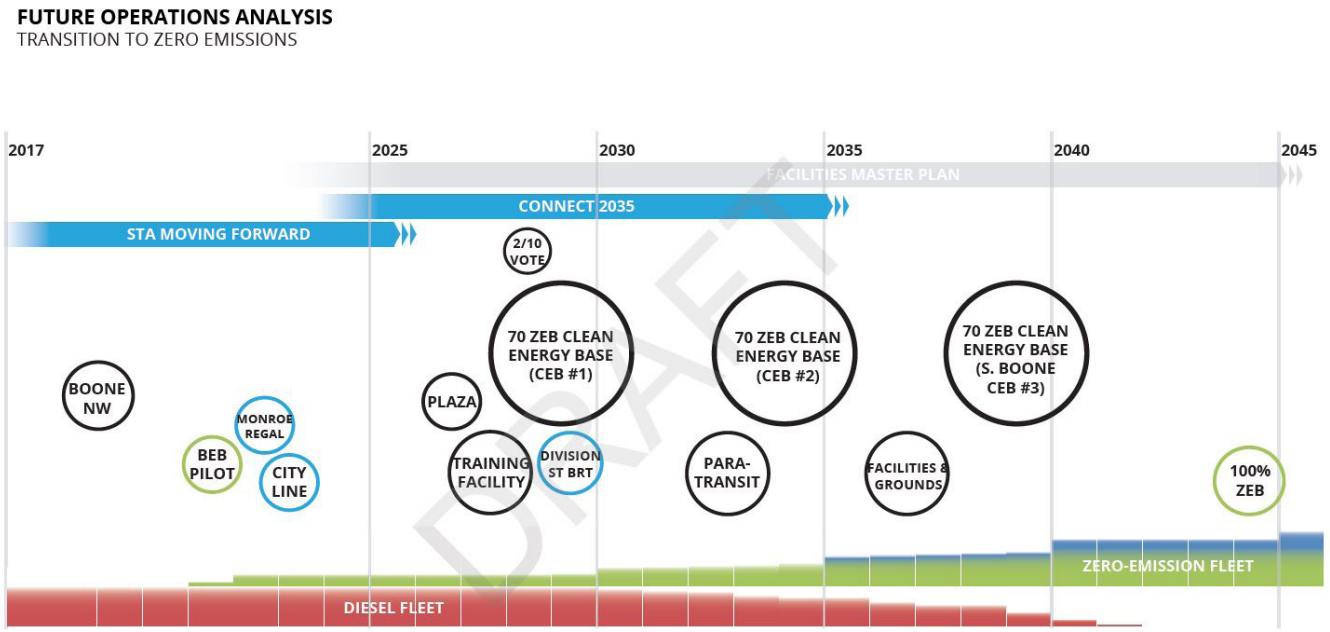
### WASHINGTON TRANSPORTATION ELECTRIFICATION STRATEGY

Washington Executive Orders and Code revisions mandate requirements for reducing greenhouse gases (GHGs) over the coming years. The specific benchmarks include limiting emissions to 45% below 1990 levels by 2030 and achieving net-zero emissions by 2050. To support these benchmarks, the state has implemented strategy and guidance for between 40% - 100% of new vehicles licensed within the state to be zero-emissions vehicles (ZEVs), with the requirement to be based on the classification of the vehicle for passenger through freight vehicles.



## STA ZEB TRANSITION STUDY

STA engaged a private consultant to perform a Transition Study for the ZEB transition which evaluated ZEB technologies assumed to be available 2022 through 2045. This Transition Study evaluates the technologies, costs, and impacts to STA service. The study evaluated battery electric buses (BEBs) and hydrogen fuel cell-electric buses (FCEBs) and considered 3 scenarios against the current technology. Scenario 2 for mixed fleet with BEBs and FCEBs has been selected for the STA Master Plan update.



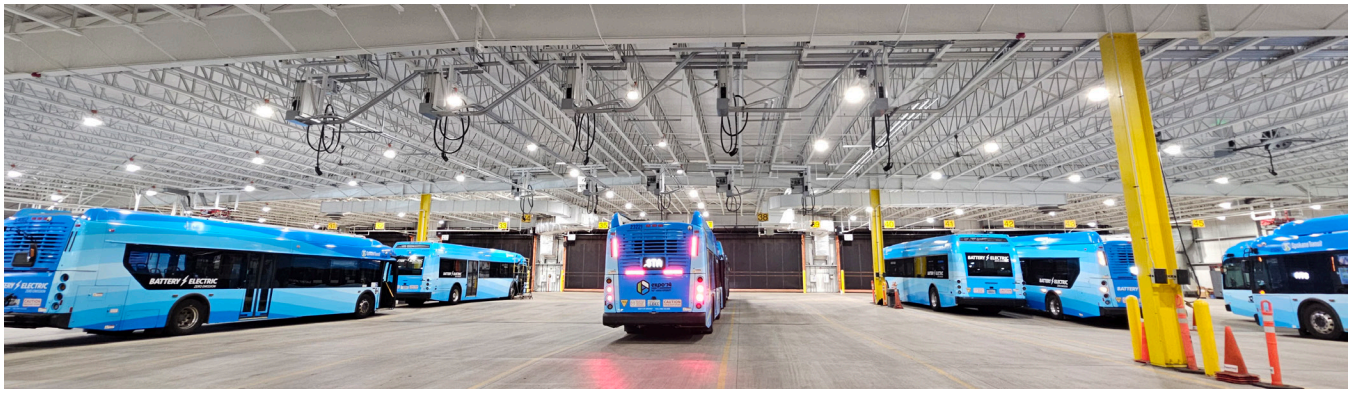

# SOLAR THERMAL AND HEAT RECOVERY OPPORTUNITIES

## SOLAR THERMAL

Solar thermal is a potential technology which has not been evaluated in this overall technologies assessment. With the exception of facilities where bus washing occurs, solar thermal is anticipated to have limited benefit for STA due to limited hot water usage. Solar thermal opportunities are not included in this report, but can be further evalutated at a site by site basis with site specific and facility specific evaluation.

## WASTE HEAT RECOVERY

Due to the limited existing heat producing infrastructure, waste heat recovery systems are not included in this report.

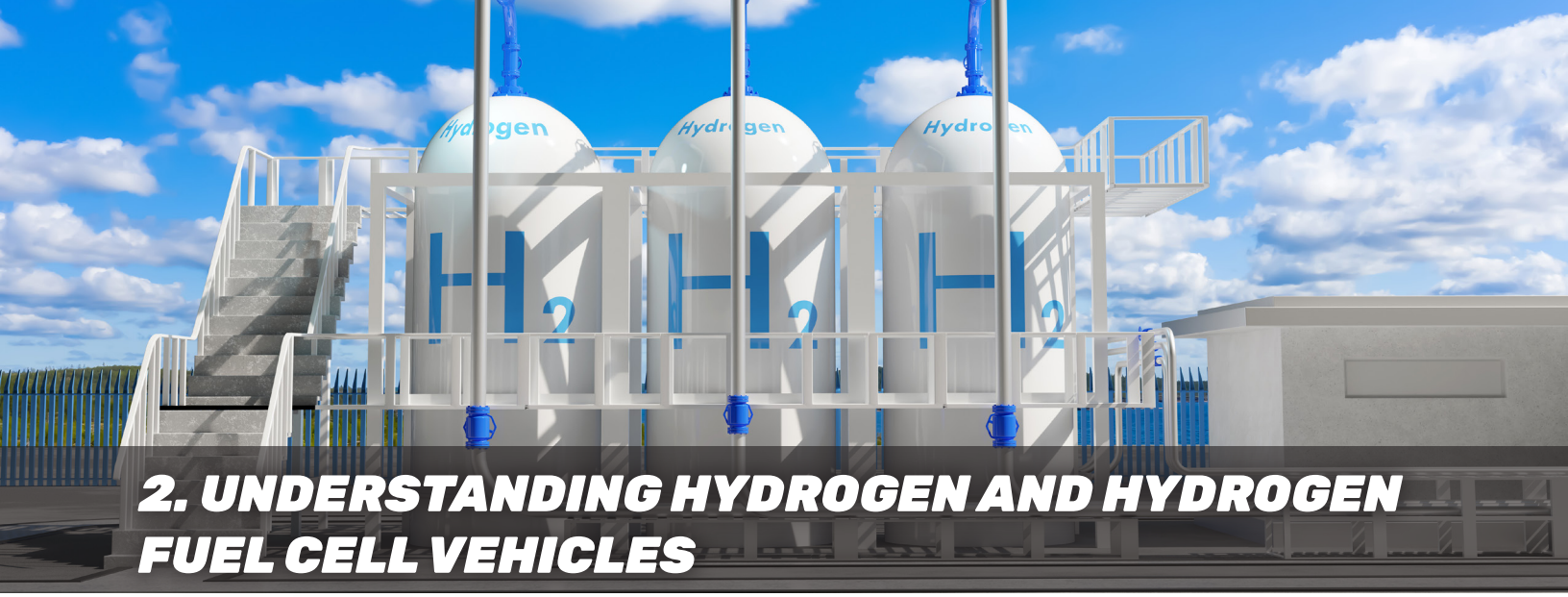


# 2

## Hydrogen Storage



COFFMAN ENGINEERS



# 2. UNDERSTANDING HYDROGEN AND HYDROGEN FUEL CELL VEHICLES

## HYDROGEN GENERAL INFORMATION

Hydrogen is the most abundant element in the universe, constituting approximately 75% of all normal matter. Pure, gaseous hydrogen doesn't exist in large quantities naturally, it must be produced from either fossil fuels, water, or biomass. Hydrogen is highly versatile and can serve as fuel for vehicles, an energy carrier for power generation, and can be a form of energy storage with it's numerous industrial uses (i.e. steelmaking, fuel desulfurization, methanol synthesis, ammonia production). Hydrogen can be produced through various production pathways, each differing in carbon intensity depending on the type of feedstock and the energy used in the production process.

### PROPERTIES OF HYDROGEN

Hydrogen in purified form is a colorless, odorless, tasteless, and highly combustible element. Purified gaseous hydrogen is a low-density gas, having approximately 7% of the mass density of air at standard conditions of 15°C and ~1 bar.

On a mass basis Hydrogen is approximately four times as energy dense as gasoline. However, due to the low density of the material on a volumetric basis gasoline is 32 times as energy dense as hydrogen at standard conditions. Much of the current focus on effectively utilizing hydrogen as a replacement fuel is focused on advancing the development of storage methods that allow hydrogen to be stored in a more energy dense state and lowering the cost of low carbon intensity production processes.

Combustion of hydrogen does not produce carbon dioxide or other greenhouse gases as a byproduct, making it a viable fuel to assist in decarbonization initiatives.

# 3

## Safety of Hydrogen



COFFMAN ENGINEERS


# 3. SAFETY OF HYDROGEN

## HYDROGEN GENERAL INFORMATION

Safety is a key consideration when working with hydrogen. The substance is highly flammable, leaks easily, and is difficult to detect. While the unique properties of hydrogen can pose risks if not handled properly, it can be safer than many conventional fuels. For example, unlike natural gas, hydrogen is non-toxic and dissipates extremely quickly.

### HYDROGEN FIRES

Hydrogen poses unique fire hazards that demand careful attention and awareness. Gaseous hydrogen has a wide flammability range of 4% to 75% in air, much broader than that of natural gas which has a flammability range of 5% to 15%. When hydrogen burns, the flames are nearly invisible to the naked eye and can be difficult to see even in low light conditions. The flames produced from burning hydrogen have lower thermal radiation, meaning you must be very close to a hydrogen flame to feel the heat and physically detect it. Despite this, the flames themselves can burn very hot at over 2760°C, easily hurting personnel and damaging property. Personnel at facilities containing hydrogen should always wear proper personal protective equipment (PPE), including full fire retardant (FR) clothing.

To protect against potential hydrogen fires and jet flames, it is critical that any facility containing hydrogen be outfitted with hydrogen flame detection systems. The most common hydrogen flame detectors used in the industry are ultraviolet/infrared (UV/IR) detectors. The detectors are calibrated to detect the specific light signature of a hydrogen flame, which is the part of the light spectrum not visible to the human eyes. Facilities should be interlocked to detectors such that automated system controls isolate the process while alarms alert site personnel and the local fire department as required by NFPA-2 and NFPA-55 fire codes. During the early design phases of any hydrogen-containing system, it is important to coordinate with the Authority Having Jurisdiction (typically the fire marshal), to review permitting drawing for the system.

### HYDROGEN LEAKS

To prevent hydrogen fires or explosions, it is essential to detect hydrogen leaks or unintended releases early and isolate the system before a flammable mixture is reached. Given hydrogen 's flammability at very low concentrations, rapid detection is crucial. There are several different types of leak detectors and their selection is dependent on the specific application.

The most common types of leak detection instruments are as follows:

**Chemical detectors** -Utilize a reagent or material that reacts to physical contact with hydrogen.

- Useful for their ability to detect hydrogen in very low concentrations (less that 1%). However, the sensor only measures hydrogen concentration at the sensor location, meaning flammable mixtures may already exist near the leak source by the time detection occurs.
- Typically located near the ceiling or within overhead enclosures, as hydrogen rises rapidly due to its low molecular weight.
- Many sensors are needed to cover a wide area. Custom hoods and piping may be installed over equipment to cover more space and direct hydrogen to a sensor in case of a leak for quicker detection.

**Acoustic Sensors** - Listens for the ultasonic sound of hydrogen leak.

- Covers a wide area and has significant flexibility for where they can be mounted.
- Low precision for determining where a leak is located when detected.
- Excellent at ignoring noise in the protected space.
- Struggles to detect smaller leaks.

For most facilities, a combination of several types of leak detection are used to provide more robust protection. If a leak is suspected in your system, either by instrumentation alert or process indication, the system should be immediately taken out of service until the leak is identified and fixed. Specialized “sniffer” tools are used to precisely locate small leaks. When sniffing out a leak, the system is pressurized with a low concentration 5% hydrogen 95% nitrogen mixture, while a hand-held wand-like device is walked along the system and alerts at the leak source. For all leak detectors, maintenance and recalibration should be performed every 3-6 months and recorded in facility records or manufacturer's instructions.

## LEAK AND EXPLOSION PREVENTION

Because of hydrogen’s small molecular size and the high pressures at which it is typically stored, it is more susceptible to leaks compared to other gases. When designing hydrogen containing systems, connection types should be selected with leak prevention in mind. For example, threaded connections are more prone to leaking compared to welded connections. Compression type fittings are often used in hydrogen applications as well, though these can be limited by their design pressure. In general, flanged connections should be avoided in high-pressure applications as these are a common leak point.

The selected materials of construction also play a role in keeping hydrogen contained within the system. Materials should be selected based on the system’s operating pressure, temperature, and flow, as well as material compatibility. Hydrogen is a reactive molecule and should not be used with malleable and ductile irons, nickel and titanium alloys, and certain grades of high strength steel. These materials can be weakened over time by the hydrogen in a process called hydrogen embrittlement. For most applications, austenitic stainless steel is recommended, though certain copper and aluminum alloys are acceptable as well.

Systems containing hydrogen are subject to hazardous electrical area classifications where all electrical instruments, equipment, and other electrical components must be properly rated and certified for the area class they are located in. Areas that are continuously or frequently exposed to hydrogen (Class 1, Division 1) are more restrictive and require more robust equipment than those which are only exposed to hydrogen under abnormal conditions (Class 1, Division 2). It is generally recommended to avoid placing electrical equipment in C1D1 classified areas to reduce risk and save cost. Areas receiving a C1D1 rating are typically those around flanges and vent stacks.

## FIRST RESPONDER TRAINING

As detailed above, hydrogen presents unique safety concerns that can pose serious risks to first responders if they are not properly informed and prepared. These risks also vary depending on the specific type of hydrogen storage used, which should be given special considerations. For example, attempting to dowse a hydrogen fire venting from a cryogenic tank with water can lead to the water freezing in the pipe and blocking the escaping gas. This can lead to the pressure building in the tank and cause deflagration or explosion, worsening the event and putting the first responders at risk. First responders should get specialized training in how to respond to hydrogen-specific incidents.

The Pacific Northwest National Laboratory (PNNL) in Richland, WA has developed a program for Hydrogen Emergency Response Training to provide first responders with both an online awareness-level course and a one-day hands-on operations-level course. Online courses, such as the "Introduction to Hydrogen Safety for First Responders" are available and provided by the American Institute of Chemical Engineers (AIChE). The practical hands-on training is also available in the area. PNNL has held such hands-on courses at the Volpentest HAMMER Federal Training Center that supports the Hanford site in Richland, WA.



# 4 Hydrogen Production (w/ Private Partner Support)



COFFMAN ENGINEERS


# 4. PRODUCTION OF HYDROGEN

## INTRODUCTION

The required hydrogen production system can be evaluated in the next stage of the Facilities Master Plan and will be based on anticipated hydrogen demand, storage requirements, site specific code analysis based on hydrogen use and storage, and other siting considerations and constraints.

Hydrogen can be produced using various methods, categorized broadly as "green," "blue," "grey", or other hydrogen production pathways:

- Water Electrolysis: This process of splitting water into hydrogen and oxygen using electricity. When powered by renewable energy, it produces "green" hydrogen with zero emissions.
- Fossil Fuel based methods, such as Steam Methane Reforming (SMR), uses natural gas to produce hydrogen. While efficient, it releases $CO_2$, making it grey hydrogen unless carbon capture technologies are applied (blue hydrogen).
- Biomass Gasification: Organic material is converted into hydrogen and other gases, offering a renewable production option.

| | TERMINOLOGY | TECHNOLOGY | FEEDSTOCK / ELECTRICITY SOURCE | GHG FOOTPRINT |
|---|---|---|---|---|
| PRODUCTION VIA ELECTRICITY | Green Hydrogen | Electrolysis | Wind, Solar, Hydro, Geothermal, Tidal | Minimal |
| | Purple/Pink Hydrogen | | Nuclear | |
| | Yellow Hydrogen | | Mixed-origin grid energy | Medium |
| PRODUCTION VIA FOSSIL FUELS | Blue Hydrogen | Natural gas reforming + CCUS Gasification + CCUS | Natural gas, coal | Low |
| | Turquoise Hydrogen | Pyrolysis | Natural gas | Solid carbon (by-product) |
| | Grey Hydrogen | Natural gas reforming | | Medium |
| | Brown Hydrogen | Gasification | Brown cool (lignite) | High |
| | Black Hydrogen | | Black coal | |

*GHG footprint given as a general guide but it is accepted that each category can be higher in some cases.

Ultimately, STA will need to carefully evaluate a range of factors to determine the most effective hydrogen production strategy. These considerations include production costs, operational expenditures (OPEX), carbon intensity, reliability, and the cost per kilogram of hydrogen ($/kg). Developing a comprehensive master plan will involve assessing the current infrastructure, advancements in technology, and the potential for cost-effective decarbonization. There is also the option to build the infrastructure to enable carbon capture or assume that as hydrogen scales in the future it will continue to lower in Carbon Intensity (CI).

By striking a balance between these trade-offs, STA can ensure it provides reliable and sustainable service while enhancing the transit experience for Spokane's citizens. Emphasizing innovation and environmental responsibility, this effort could pave the way for a cleaner, more efficient future in public transportation.

## H2 PRODUCTION METHODS

There are various hydrogen production methods, like steam methane reforming (SMR), methane pyrolysis, and geologic stimulated hydrogen. While suitable for large-scale industrial use, they are less practical for smaller applications.

Depending on regional resources and infrastructure, the optimal hydrogen production pathway can vary significantly. For instance, the Pacific Northwest, with its historically low-carbon-intensity power grid, presents a strong case for green hydrogen production through renewable energy sources like wind and solar. This region's limited oil and gas infrastructure further supports the push toward sustainable options. However, the growing energy demands from AI data centers are placing increasing strain on the grid, potentially complicating efforts to expand green hydrogen production.

Given these challenges, it becomes imperative to explore a diverse portfolio of low-carbon hydrogen production methods. Options such as methane pyrolysis or utilizing renewable natural gas could complement renewable-powered water electrolysis in meeting hydrogen demands, while maintaining environmental goals. With a balanced approach, the Pacific Northwest could establish itself as a leader in sustainable hydrogen production, even amidst rising energy demands.

## ALKALINE ELECTROLYSIS

Alkaline water electrolysis represents one of the most established and widely-used methods for producing hydrogen, offering a pathway to cleaner energy with minimal environmental impact. This process utilizes the electrochemical splitting of water (H2O) into hydrogen (H2) and oxygen (O2) using electricity and operates in an alkaline environment supported by a liquid electrolyte.

## PROTON EXCHANGE MEMBRANE (PEM)

This technique involves the electrolysis of water to produce hydrogen ions and oxygen gas. Subsequently, a membrane selectively permits the passage of hydrogen ions, effectively separating them from the oxygen and residual water. These ions subsequently combine to form hydrogen gas.

## SOLID OXIDE (OEL)

This method divides water into hydrogen gas and oxygen ions instead of hydrogen ions and oxygen gas. The oxygen ions then pass through a membrane and become oxygen gas.

## ANION EXCHANGE MEMBRANE (AEM)

This method is similar to AEL in that it also splits water into hydrogen gas and hydroxide ions. The hydrogen is separated to one side of the membrane and the hydroxide ions form back into water. There is one other method that may be appropriate for a project of this scale.

## MICRO-CHANNEL SMR

Micro-channel SMR has a very small footprint and can use existing natural gas pipelines/infrastructure to produce hydrogen can use existing natural gas pipelines/infrastructure to produce hydrogen. If the process is fed with renewable natural gas, it can be a viable low-carbon intensity option. However, electrolyzers are the recommended method for this application.

## METHANE PYROLYSIS

Methane pyrolysis is a process that decomposes methane and breaks it down into hydrogen gas and solid carbon through heating without oxygen. There are no emissions of carbon monoxide (CO) or carbon dioxide (CO2). It can utilize renewable natural gas or methane emissions obtained from current processes.

## STEAM METHANE REFORM (SMR)

Steam methane reforming (SMR) remains the dominant method for hydrogen production in the United States, utilizing high temperature steam between 700°C and 1,000°C to extract hydrogen from methane-rich sources like natural gas. In this process, methane reacts with steam at pressures ranging between 3 and 25 bar (with 1 bar equivalent to 14.5 psi), facilitated by a catalyst, to yield hydrogen, carbon monoxide, and a small quantity of carbon dioxide. As an endothermic reaction, SMR requires a continuous supply of heat to sustain the chemical transformation. Despite its widespread use, SMR is associated with significant greenhouse gas emissions, contributing to climate challenges. This underscores the importance of pursuing advancements in low-carbon alternatives, such as renewable natural gas integration or novel hydrogen production techniques.

## AUTO THERMAL REFORMING (ATR)

ATR is widely recognized process for producing hydrogen from hydrocarbon fuels such as natural gas. It is an advanced method that combines two conventional techniques: steam methane reforming (SMR) and partial oxidation (POX). By integrating aspects of both, ATR achieves high efficiency and scalability, making it a valuable approach in large-scale hydrogen production applications.

## SUBSURFACE HYDROGEN

Subsurface geology presents a compelling opportunity to significantly reduce hydrogen production costs, potentially unlocking a variety of economic use cases. By harnessing naturally occurring reservoirs or stimulating geological processes, this innovative approach minimizes the need for intensive chemical or energy inputs. As such, it represents an avenue that cannot be overlooked in the pursuit of scalable, cost-effective hydrogen production solutions.

## GEOLOGICAL HYDROGEN

One of the primary methods for producing geological hydrogen involves recovering hydrogen gas that accumulates naturally in subsurface reservoirs. These reservoirs form over geological timescales as hydrogen is generated through a variety of natural processes.

## STIMULATED GEOLOGICAL HYDROGEN

This emerging pathway leverages the reaction between specific types of subsurface rock and water to produce hydrogen on-site. Known as geological stimulation, this method involves:

- Identifying rock formations with the necessary chemical properties to generate hydrogen when exposed to water.
- Pumping large quantities of water into these formations to trigger the reactions that release hydrogen.

Though still in its infancy, geologic stimulated hydrogen production holds promise for unlocking vast new hydrogen resources with minimal upfront chemical or energy inputs.

## APPLICABILITY FOR SPOKANE REGION & STA

Hydrogen production technologies like PEM electrolysis, OEL, pyrolysis, SMR, and ATR each balance unique advantages and challenges, from PEM's high-purity, zero-emission output with costly materials, to SMR's cost-effectiveness but reliance on fossil fuels. Choosing the best pathway demands weighing economic, environmental, and scalability factors for specific applications, such as sustainable transit solutions.

In evaluating the viability of hydrogen production pathways, several critical factors must be considered to ensure both economic and environmental feasibility. These considerations encompass the following key aspects:

- **Economic Considerations:** Establishing a cost-effective hydrogen supply chain is critical. While SMR and ATR can reduce costs initially, PEM electrolysis may align better with long-term decarbonization goals despite its higher upfront cost.
- **Infrastructure Requirements:** Transit authorities may need to balance existing technologies with scalable infrastructure investments.
- **Environmental Goals:** For authorities pursuing net-zero emissions, pathways like PEM electrolysis or renewable-energy-integrated production methods are crucial. Fossil-fuel-based pathways may require additional carbon capture to align with these objectives.
- **Scalability:** Stimulated geological hydrogen and emerging technologies may hold future promise but are unlikely to meet immediate, large-scale transit needs.

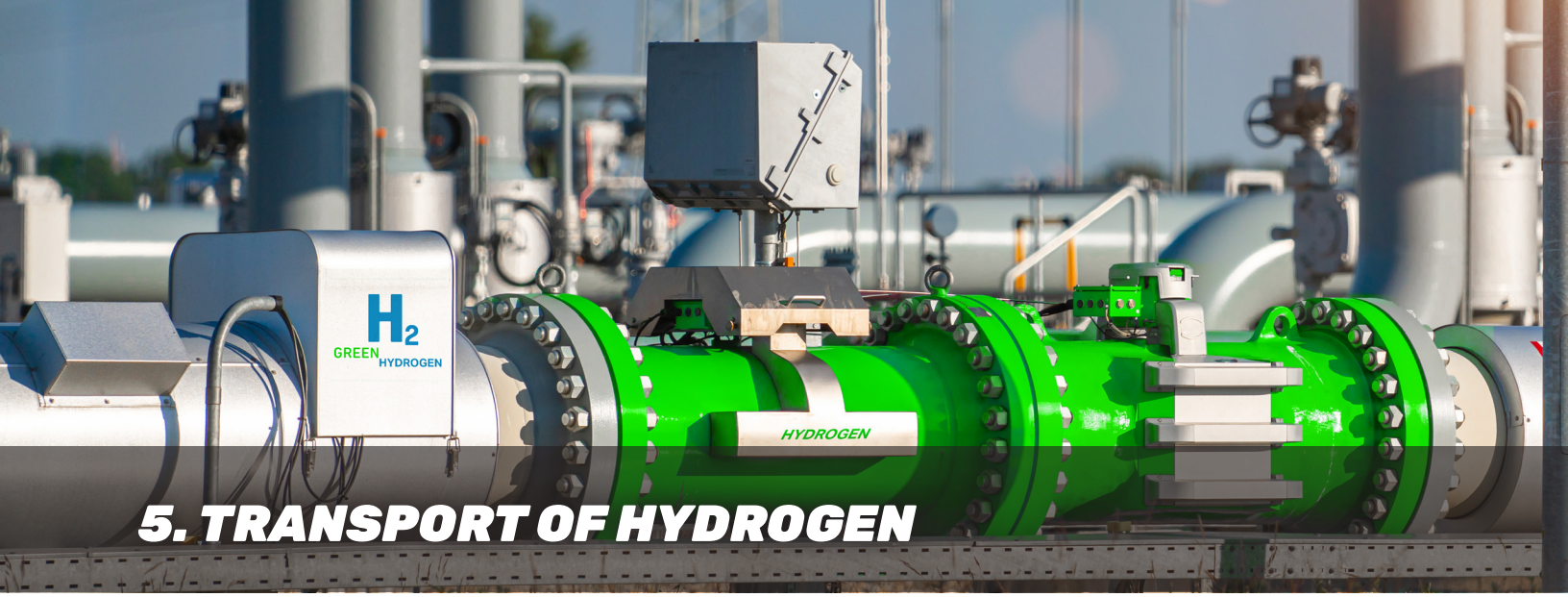
Hydrogen production technologies, including PEM electrolysis, OEL, pyrolysis, SMR, ATR, and emerging methods like geologic stimulated hydrogen production, each present distinct economic, environmental, and scalability trade-offs. While PEM electrolysis offers high-purity, zero-emission hydrogen ideal for long-term decarbonization goals, it requires costly materials. In contrast, SMR and ATR provide cost-effective options but rely on fossil fuels and may need carbon capture to meet environmental targets. Infrastructure, economic feasibility, and alignment with net-zero objectives are critical considerations. Emerging approaches, such as geological stimulated hydrogen, show promise but currently lack the scalability needed for large-scale applications like sustainable transit solutions.

# 5

# Transport of Hydrogen



COFFMAN ENGINEERS




# 5. TRANSPORT OF HYDROGEN

## INTRODUCTION

Transporting hydrogen requires specialized methods due to its low density and high flammability. Common transportation methods include:

- **Compressed Gas:** Hydrogen is stored in high-pressure cylinders or tanks for easy transport.
- **Liquid Hydrogen:** Hydrogen is cooled to cryogenic temperatures (-253°C) and transported as a liquid, increasing its energy density.
- **Pipelines:** Dedicated pipelines can transport hydrogen efficiently over short-to-medium distances.

### COMPRESSED GAS

Compressed gas transportation of hydrogen is a widely adopted method due to its relative simplicity and feasibility for various scales of operation. Hydrogen is stored in high-pressure cylinders or tanks, often at pressures ranging from 200 to 700 bar, depending on the application and transportation distance. These tanks are constructed using advanced materials such as carbon fiber composites, which ensure strength while minimizing weight. The use of reinforced containers and automated pressure control systems further enhances safety during transit. This method is particularly suitable for supplying hydrogen to fueling stations or small-scale industrial users without the need for extensive infrastructure like pipelines.

Several companies specialize in manufacturing and offering commercial units for compressed hydrogen gas transport or as a service. These companies continue to push the boundaries of technology to make hydrogen transport more accessible and sustainable.

### CRYOGENIC TRANSPORT

Cryogenic transport significantly increases the volume for long-distance transport. This method is particularly advantageous for industries requiring large volumes of hydrogen, such as aerospace, chemical manufacturing, and clean energy sectors. Specialized cryogenic tanks constructed from advanced materials, often equipped with vacuum insulation, are employed to minimize boil-off and maintain the required low temperatures.

Numerous companies engage in cryogenic hydrogen transport, including global leaders in industrial gas supply such as Air Liquide, Linde, and Air Products. These firms have developed sophisticated infrastructure and technology to reliably store and transport liquid hydrogen. Dedicated vehicles equipped with cryogenic storage tanks ensure safe delivery, supported by rigorous safety protocols. Cryogenic hydrogen transport has been safely conducted for several decades, with advancements in materials science and engineering further enhancing its reliability. This long track record underscores the method's viability in supporting hydrogen's role as a cornerstone of future clean energy systems.

## PIPELINE

Pipeline transport of hydrogen is an established method particularly suited for short-to-medium distances, offering significant efficiency once the necessary infrastructure is in place. Widely regarded as one of the most cost-effective methods for large-scale hydrogen distribution, pipelines eliminate the need for repeated loading and unloading, thus reducing operational costs over time. However, the initial capital investment for constructing dedicated hydrogen pipelines can be prohibitively high, especially in regions without existing infrastructure. Retrofitting natural gas pipelines for hydrogen transport is unlikely due to material compatibility and safety standards.

## APPLICABILITY FOR SPOKANE REGION & STA

Given the absence of extensive pipeline infrastructure in the Spokane region, STA may consider relying on high-pressure tube trailers for compressed hydrogen gas transport as a practical solution for small-scale operations. For larger hydrogen volumes, cryogenic storage can be employed, leveraging specialized insulated tanks to minimize boil-off losses. Both methods offer flexibility in addressing regional hydrogen needs, with cryogenic transport being advantageous for industries requiring significant quantities. Coordinating with other potential users to establish shared infrastructure could reduce both capital expenditure (CAPEX) and operational expenditure (OPEX), making hydrogen transport more economically feasible for the region. Small regional pipelines could also be developed where applicable to optimize efficiency for localized distribution.



# 6

# Hydrogen Storage



COFFMAN ENGINEERS

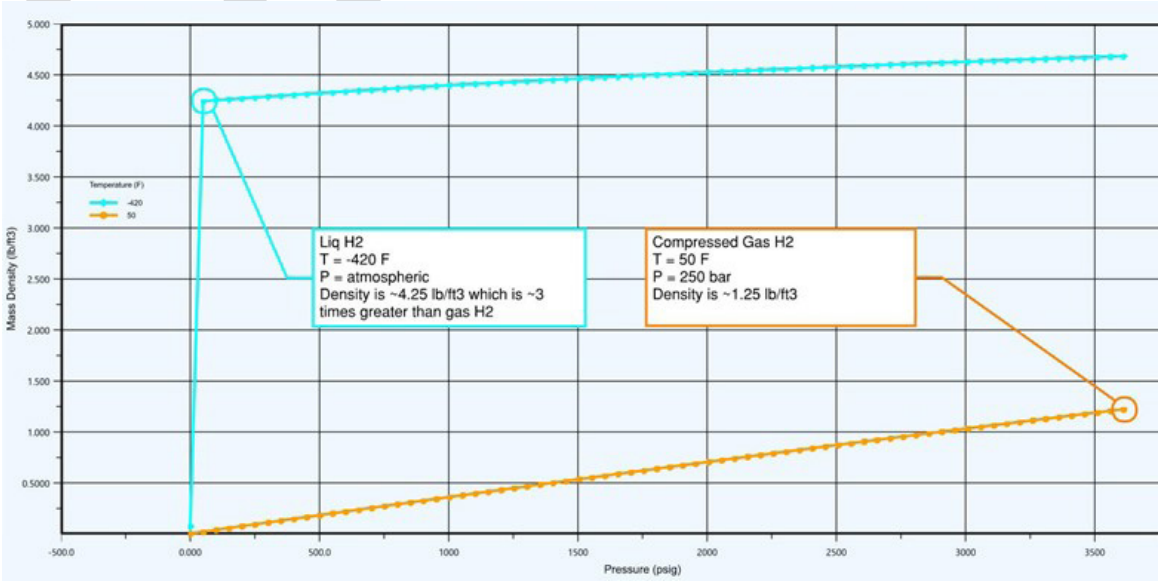
# 6. HYDROGEN STORAGE

## INTRODUCTION

Hydrogen has the highest energy per mass of any fuel; however, its low ambient temperature density results in a low energy per unit volume, therefore requiring the development of advanced storage methods that have potential for higher energy density. Transit refueling stations make use of physical hydrogen storage in either a high pressure gaseous form or a low pressure cryogenic liquid form.

Storage of hydrogen as a gas typically requires high-pressure tanks (345 to 689 bar). Storage of hydrogen as a liquid requires cryogenic temperatures because the boiling point of hydrogen at one atmosphere pressure is –252.8°C. Selection of storage in a liquid or gas form is generally an economic and engineering trade off analysis with lower pressures to store larger volumes at colder temperatures with associated engineering and material challenges.





## LIQUID H2 STORAGE PROCESS CONSIDERATIONS

Liquid hydrogen (LH2) is typically stored at near atmospheric pressure, requiring cryogenic temperatures to maintain its liquid state. The liquified hydrogen is stored at its saturation point, any heat added to the liquid will begin to vaporize the stored hydrogen, causing product loss in the form of Boil Off Gas (BOG). Minimization of heat transfer into liquid hydrogen is a key process design consideration for any LH2 installation. Double walled vacuum insulated storage tanks and vacuum jacketed piping systems are typically used in cryogenic applications. The vacuum space between the interior and exterior walls minimizes convective heat transfer between ambient conditions and the LH2 product.

Management of BOG is another consideration for liquid hydrogen storage. As LH2 stored in the tank begins to vaporize it will begin to build pressure in the storage tank and will require venting to atmosphere or to a vapor recovery system designed to compress the BOG for utilization by any consumers on site such as hydrogen fuel cells for power generation (if available).

Materials of construction for equipment in LH2 service must be chosen carefully for compatibility with both purified hydrogen and cryogenic temperatures. 304 or 316L stainless steel materials of construction have been found to have acceptable properties for LH2 applications.

Utilizing LH2 storage will require that a vaporization system also be installed on site as the hydrogen will need to be converted to a gaseous form before flowing into the refueling sites' dispensing system.

Venting systems have special design considerations in LH2 service; vent stacks must be constructed so that the hydrogen will relieve upwards and away from equipment in addition to a stack design that doesn't allow formation of blockages. Proper geometry of the vent stack outlet will direct the flow of hydrogen upwards so that it quickly dissipates. Use of liquid accumulation pots in the base of the vent stacks in LH2 service will prevent liquid buildup inside the stack itself.

Safety considerations around cryogenic liquid storage are discussed in the hydrogen safety section.

## GASEOUS H2 STORAGE PROCESS CONSIDERATIONS

Gaseous hydrogen storage involves the compression of purified hydrogen gas in order to increase its volumetric energy density. Depending on site considerations, required storage volumes and the economics of equipment for a given facility gaseous H2 is typically stored in a range of 345 to 689 bar in metal storage tanks.

Utilizing gaseous H2 storage will require a compression system to be installed at the fuel depot. The compression system will also require cooling as compression to the levels required for storage will add a significant amount of heat to the gas. A vaporizer is not required as part of a gaseous storage system as no phase change in the hydrogen will be occurring.

Due to the relatively small molecule size and increased density at the elevated storage pressures, gaseous H2 storage is susceptible to small leaks through flanged connections, pinholes, or any non-welded connections. A robust leak detection system should be utilized around high-pressure gaseous hydrogen storage.

Storage at the elevated pressures required comes with safety considerations that are discussed in the hydrogen safety section.

## SOLID MATERIAL STORAGE

Solid-state hydrogen storage is an area of intensive research and development, with varying levels of technological maturity depending on the material.

Solid-state hydrogen storage refers to the method of storing hydrogen in a solid material, typically in the form of metal hydrides, chemical hydrides, or advanced porous materials such as metal-organic frameworks

(MOFs) and carbon-based materials. This storage method offers several advantages, including higher volumetric capacity, improved safety compared to compressed or liquid hydrogen, and the elimination of high-pressure systems.

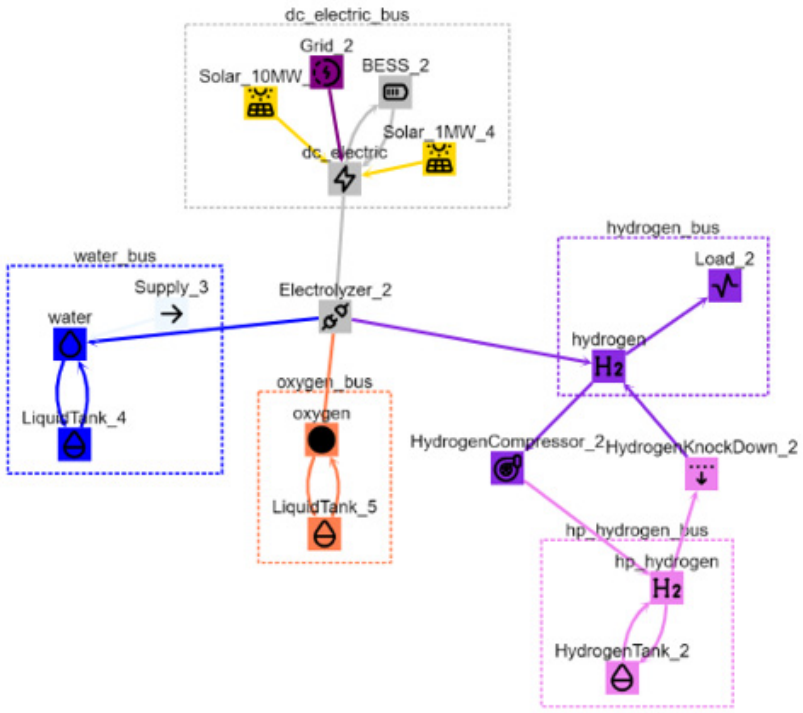
There are very few vendors offering it currently, but there is a growing market presence; one example is GKN Hydrogen who began offering material-based storage modules in 2020.

## APPLICABILITY FOR SPOKANE REGION & STA

Hydrogen storage options—gaseous, solid-state, and cryogenic—each present unique operational and economic considerations, such as equipment costs (capex), operational efficiency (opex), and reliability. Gaseous storage involves compression systems and robust leak detection, while solid-state storage, though safer and more compact, requires heating to release hydrogen, with limited market availability. Cryogenic storage demands additional steps for vaporization. These methods directly impact hydrogen transport and dispensing systems, as refueling needs vary based on storage type, vehicle fleet size, and daily refueling logistics.

To ensure consistent fueling of a bus fleet 365 days a year, even amidst supply disruptions, an optimal balance of storage capacity, cost-efficiency, and infrastructure reliability must be achieved, tailored to the number of procured buses and operational demands.

This intricate analysis of hydrogen storage and refueling methods highlights the importance of tailoring solutions to the specific operational needs of the STA. To move forward effectively, such considerations must be deeply integrated into a comprehensive master plan study. This study would serve as the next critical step for STA, ensuring that all storage types—gaseous, solid-state, and cryogenic—are evaluated against regional requirements, including bus fleet size, refueling logistics, and emergency supply continuity. Coffman leverages its AI facility optimizer to streamline hydrogen infrastructure development by determining the optimum sizing for every component, from electrolyzers to fuel nozzles. This advanced technology enables companies to make well-informed decisions, balancing tradeoffs such as capital expenditure, operational efficiency, and scalability. By integrating these insights, stakeholders can achieve a tailored approach that supports reliability and cost-efficiency while meeting specific regional needs and operational demands.



# 7

# Hydrogen Fuel Dispensers



COFFMAN ENGINEERS


# 7. HYDROGEN FUEL DISPENSERS

## INTRODUCTION

Hydrogen dispensing involves transferring hydrogen from storage tanks at a refueling station to vehicles in a safe and controlled manner using specialized equipment. The refueling stations store bulk hydrogen as either a cryogenic liquid, high-pressure gas, or have hydrogen generation on-site, which is then compressed prior to dispensing. Most hydrogen fuel cell vehicles utilize high pressure gas tanks, though there are vehicles being developed by automakers that utilize on-board low-pressure liquid hydrogen storage. These two types of dispensing pose their own benefits and considerations:

**Gaseous Hydrogen Dispensing:**

- No hydrogen boil-off in vehicle fuel tanks.
- Sites design can be simplified if cryogenic hydrogen is not required. However, many refueling stations will store bulk LH2 due to its higher density, then vaporize and warm the hydrogen up to the dispensers operating pressure, between -33°C and -40°C. In this case, cryo pumps are typically used to increase the pressure of LH2 to the dispensing pressure, prior to vaporization.
- Can utilize “cold recovery” systems that help maintain the maximum allowable hydrogen density at the dispenser but exchanging heat with the LH2 vaporization system.
- Specialized tanks are required to handle > 827 bar.
- Freezing water condensate must be mitigated.

**Cryogenic Hydrogen Dispensing:**

- Provides maximum energy density in vehicles for increased range.
- Hydrogen must be vented from storage tanks to prevent overpressure as the liquid evaporates.
- Specialized tanks are required to handle liquid hydrogen while minimizing boiloff.
- Liquid and condensate and nozzle freezing must be mitigated.
- Compression may be needed for boil-off recovery.

Hydrogen fuel cell engines require extremely high purity hydrogen to function efficiently and avoid damage. The purity requirement varies slightly between GH2 and LH2 where GH2 is typically 99.995% H2 by volume and LH2 is 99.998% by volume. There are additional purity requirements that account for contaminants, such as oxygen, which are covered by SAE J2719 or ISO 14687 specifications for PEM fuel cells. Fueling stations should be designed and fabricated to facilitate specialized cleaning and purging, allowing purity requirements to be maintained. Both cryogenic and gaseous hydrogen fueling stations are designed to accommodate the needs of transit vehicles, including buses, providing fast refueling. There are many well documented issues with reliability that many entities are working to address. Coffman is leading efforts in this space.

## APPLICABILITY FOR SPOKANE REGION & STA

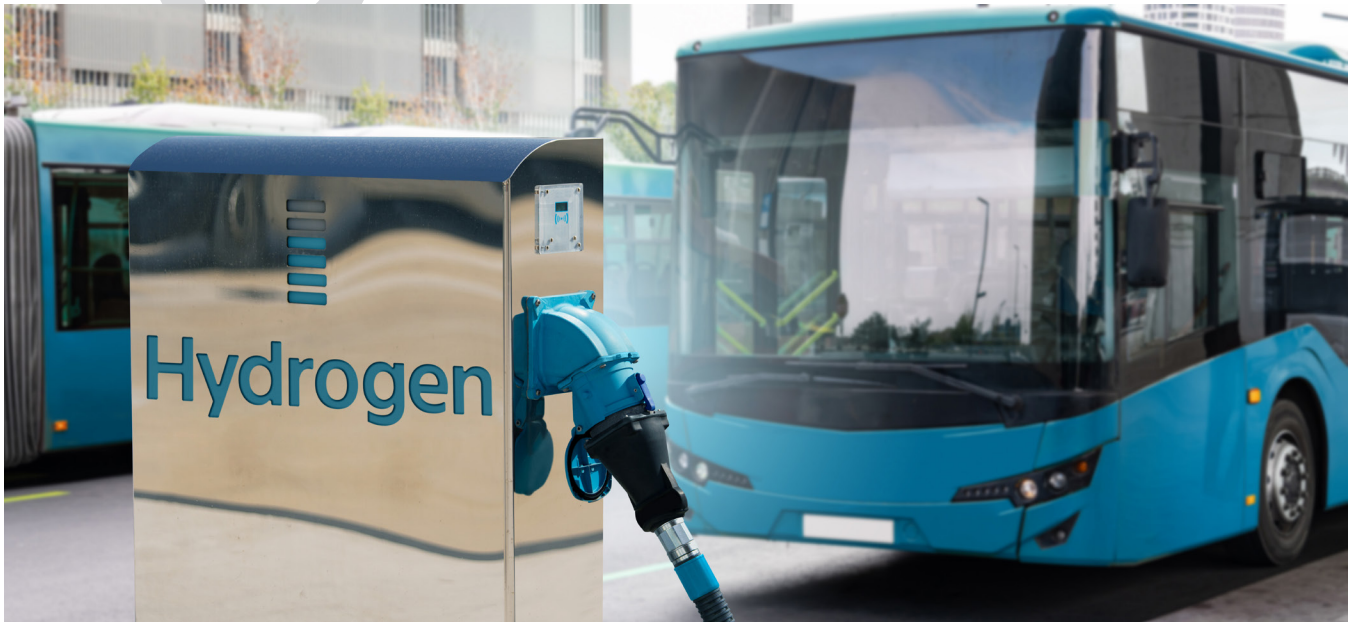
Hydrogen dispensers play a critical role in fueling vehicles, particularly transit buses, with either gaseous or liquid hydrogen. Liquid hydrogen provides high energy density, extending vehicle range, but requires specialized tanks to minimize boil-off and vent excess hydrogen to prevent overpressure. Gaseous hydrogen dispensers must manage high pressures, exceeding 827 bar. Both types require mitigation strategies for freezing water condensate and nozzle freezing. The hydrogen used must meet stringent purity standards—99.995% for gaseous and 99.998% for liquid—ensuring efficient fuel cell engine performance and avoiding damage. These purity levels are governed by SAE J2719 or ISO 14687 specifications, requiring fueling stations to facilitate thorough cleaning and purging processes. While cryogenic and gaseous hydrogen dispensers enable fast refueling, reliability challenges remain.

For the master plan, siting requirements must consider indoor and outdoor installations, factoring in codes, life safety, and facility-specific needs. Spokane can benefit from nearby hydrogen suppliers in Richland and St. Regis and leverage regional infrastructure like Chehalis for fuel-cell electric buses.

## SITING CONSIDERATIONS & REQUIREMENTS

Indoor hydrogen fueling considerations are to be incorporated in the next stage of the Facilities Master Plan and Clean Energy Campus. Indoor fueling requirements will be based on facility, technologies, codes, and regional installations. The next stage of design is to include a site and facility specific analysis for hydrogen fueling for indoor and outdoor installations with code and life safety consideration based on site and facility specifics.





# 8

# Hydrogen Hubs and Availability

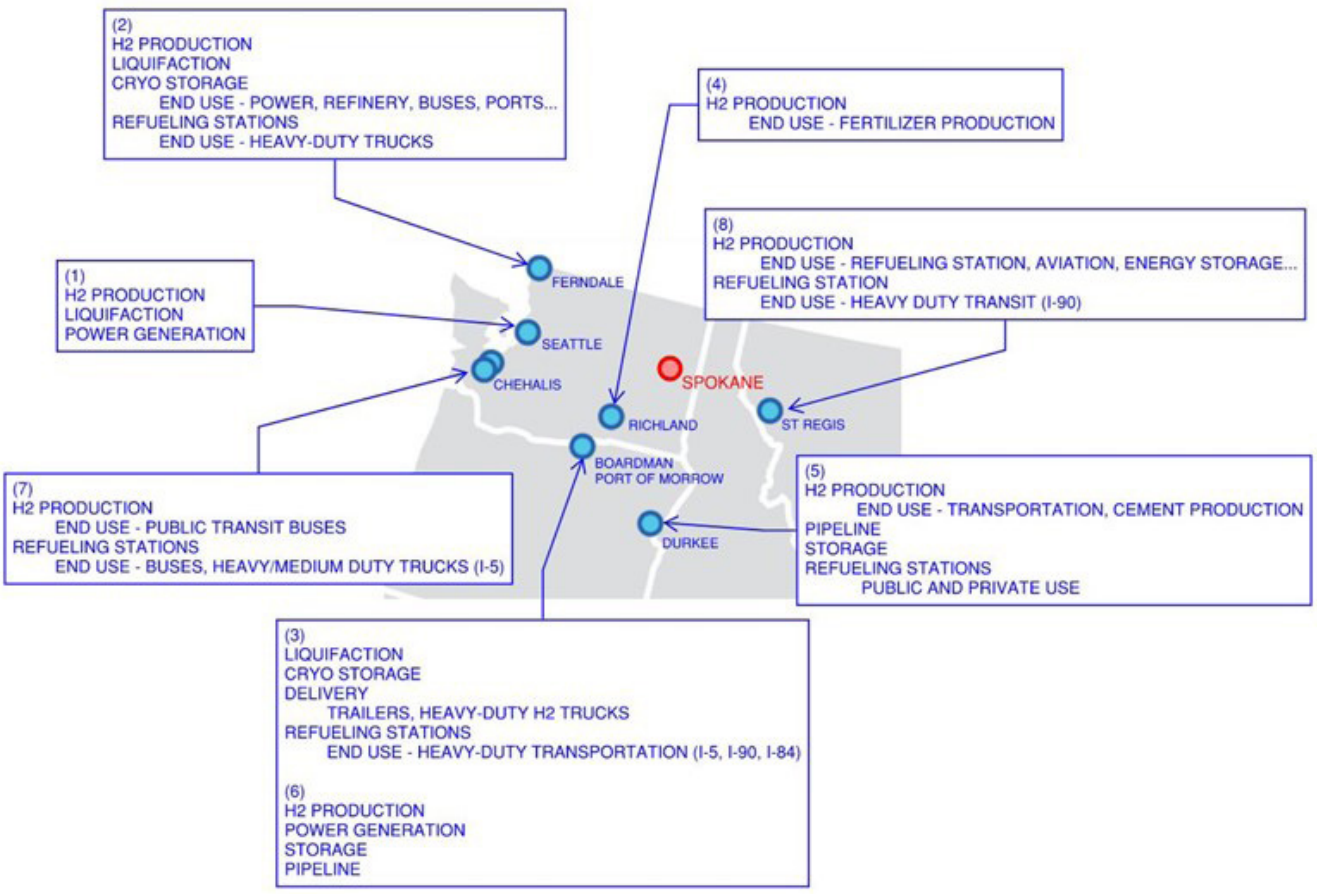


COFFMAN ENGINEERS

# 9. HYDROGEN HUBS AND AVAILABILITY

## HYDROGEN HUBS

The US Department of Energy (DOE) began the Regional Clean Hydrogen Hubs project and has awarded $1B to the Pacific Northwest Hydrogen Association (PNWH2) to create a hydrogen hub in the region of Washington, Oregon, and Montana. The PNWH2 hub will utilize the wealth of renewable energy in the area to produce green hydrogen via electrolysis. This will make hydrogen more readily available in the region as well as helping to drive down the cost of hydrogen. Below is a graphic breaking down the eight nodes of the PNWH2 hub in development.



## POLICY AND FINANCIAL CONSIDERATIONS

The uncertainty surrounding the continuation of the hydrogen tax credit 45V under current legislation introduces significant financial implications for hydrogen projects. This tax credit has been a crucial factor in supporting the economic viability of hydrogen infrastructure development. Any changes or rollback in this policy could impact the cost-effectiveness of hydrogen production, especially green hydrogen, and influence investment decisions. Stakeholders must carefully assess how these potential legislative shifts might affect the long-term feasibility and operational planning of hydrogen hubs in the region.

## APPLICABILITY FOR SPOKANE REGION & SPOKANE TRANSIT AUTHORITY

The Richland, WA and St Regis, MT sites will both be producing H2 within 150 miles of Spokane, creating nearby future suppliers. The Richland facility is primarily producing H2 to be used in the production of fertilizer and it is unclear whether it will also supply H2 for commercial sale. Additionally, Chehalis will be building infrastructure for fuel-cell electric bus (FCEB) public transit, providing the STA with a regional example of the infrastructure required which may prove to be an advantageous blueprint. However, the PNWH2 hub nodes will likely not be operational until 2035 (this is a goal by the DOE).

The companies that will be involved in H2 production or storage for the PNWH2 hub are listed in the table below, providing a directory of potential suppliers for the Spokane region.

| Company | Node | Location | Proposed Role in the Hub |
|---|---|---|---|
| Air Liquide Hydrogen Energy US LLC | 3 | Port of Morrow | Hydrogen liquefaction, distribution and market activation |
| ALA Renewable Energy LLC, An Alta Gas Company | 2 | Ferndale | Clean hydrogen production to decarbonize heavy transportation, refineries and power generation |
| Atlas Agro | 4 | Richland | Hydrogen production, agricultural end-use |
| MHI Hydrogen Infrastructure LLC | 6 | Boardman | Hydrogen production, storage, delivery and peak power |
| Express Ranch Hydrogen | 5 | Durkee | Hydrogen production, heavy-duty industrial transportation |
| PUD No. 1 of Douglas County | 3 | Port of Morrow | Clean hydrogen production |
| St. Regis Solar, LLC | 8 | St Regis | Hydrogen production, transportation and off-grid |
| Lewis County Transit | 7 | Chehalis | Hydrogen production and fueling, public transit |
| USA Fortescue Future Industries, Inc. | 1 | Seattle | Clean hydrogen production |
| Williams Field Services Group, LLC | 6 | Boardman | Hydrogen transmission and storage facilities |

Note: If liquid H2 storage is preferred then Air Liquide (Node 3), Alta Gas (Node 2), PUD No. 1 (Node 3), and Fortescue Future Industries (Node 1) have liquefaction and cryogenic storage capabilities for delivering liquid H2. Alternatively, Atlas Agro (Node 4), MHI Hydrogen Infrastructure (Node 6), Express Ranch Hydrogen (Node 5), St. Regis Solar (Node 8), and Williams Field Services (Node 6) produce gaseous H2 if pressurized storage is preferred. These options are elaborated on under the “Hydrogen Storage” section of this document. There is some availability of H2 in the area aside from the H2 hubs. Vancouver, Canada has planned a facility to produce and store liquid H2 to be operating by the end of 2026. This facility will supply several fueling stations and commercial customers.

## ADVANTAGES & DISADVANTAGES

One of the disadvantages of receiving H2 from a supplier is the need to transport the H2 from the supplier to STA use. This can be done one of three ways, via pipeline, cryogenic tanker truck, or compressed gas tube trailers. Building a pipeline is extensive and costly and only viable in cases where the demand for H2 is very high (100 tons/day or more) and is expected to remain so for several decades. An over-the-road solution is better suited to serve an FCEB fleet. Cryogenic tanker trucks can carry roughly five times the amount of H2 compared to compressed gas tube trailers. This is partially due to the higher density of liquid H2, allowing more H2 molecules to fit per a fixed volume, and partially due to the differing design constraints of the two carrier methods. For example, the compressed gas tubes must be strong enough to withstand high pressure, which makes the tubes extremely heavy. The weight limit that the trailer can haul then restricts the size of the tubes and by extension the capacity of H2 that can be transported. This should inform the choice between liquid or gaseous H2 delivery along with the details outlined in the “Hydrogen Storage” and “H2 Fuel Dispensers” sections of this document.

## COST CONSIDERATIONS

As a part of the Regional Clean Hydrogen Hubs project, the DOE has also established the Hydrogen Demand Initiative (H2DI). Using private investment from several stakeholders, the H2DI is intended to build a viable H2 market (production to end-use). While this initiative is still in development, the ultimate goal is that the H2DI is able to connect H2 hubs to end users and decrease the cost and risk of H2 industry by leveraging governmental funding and tax credits as well as private/commercial investment. This may lead to greater assistance for the STA to establish FCEB infrastructure in Spokane.

One of the things the H2DI will be assisting in streamlining for the H2 industry is the application and issuing of the 45V tax credit. This is a green hydrogen production tax credit that will reimburse up to $3 per kilogram of H2 produced (the precise rate being dependent on the level of carbon emissions throughout the production pathway). The STA could benefit from this credit by producing H2 and may even benefit through purchasing H2 if the tax credit results in a reduced market price.

Another major effort by the H2DI is to assist in reaching the DOE hydrogen fuel price goal for 2031. The DOE would like to reach a production cost below $1 per kilogram of H2 produced, resulting in a down-the-line delivery cost of $7 per kilogram. The STA would benefit from this effort by producing or purchasing H2.

# 9

# Electric Vehicle Charging Stations



COFFMAN ENGINEERS

# 9. ELECTRIC VEHICLE CHARGING STATIONS

## INTRODUCTION

As a critical component of STA's fleet operations, electric vehicle charging stations are and will continue to be essential infrastructure for BEB deployment. Based on STA's past experience, charging can be provided outdoors or indoors, with careful consideration of siting, life safety, and code requirements.

### SAFETY & HAZARD CONSIDERATIONS

Safety hazards typically considered for EV charging include fire, electrocution, and arc flash. These hazards include those caused by external factors, such as environmental, external heat sources, and failures within electrical vehicles. It is important to consider external factors, as historically these have contributed to the majority of near misses and incidents. It is also important to consider that the charging station should be evaluated as a system which includes installation location, upstream electrical equipment, pedestrian and vehicular traffic routes, fire protection, detection, and the types of vehicles likely to use the station. All these factors have a high influence on frequency of failures, and when addressed, can significantly lower the failure frequency.

#### Typical Failure Modes (in order as reported by users on ChargedEV, Teslarati, Plugshare)

- Human/Operator Damage (includes running over cables and connectors)
- Equipment Failure-cable cooling system
- Equipment Failure-software
- Equipment Failure-power modules
- Inadequate or Infrequent Maintenance
- Equipment Failure- contactors
- External Damage (Vehicular, Environment, surrounding building or brush fire)

#### Typical Failure Types

- Arc Flash caused by overloading of wiring or breakers.
- Arc Flash caused by intrusion of water into the equipment
- Arc Flash or Electrocution caused by vehicular impact to station
- Electrocution due to cable or connector wear
- Electrocution due to improper or inadequate grounding
- Electrocution due to water/moisture on the exposed charging connectors
- Fire caused by internal or external arc flash event
- Fire in EV caused by overcharging of EV battery
- Fire in EV caused by other charging station fault

### Failure Mitigation (in perceived order of importance)

- Prepare emergency response plans and coordinate with the Local Fire fighting agency.
- Ensure installation conforms to the latest requirements in the National Electric Code, local, state, federal codes, and the upcoming ANSI Standards.
- Ensure to purchase listed equipment including breakers, cables, charging equipment listed to UL 2202, and listed charging cables and plugs. Note just because equipment has a label, often indicating conforms to, does not mean the equipment is listed.
- Provide appropriate fire protection, detection, and alarm systems.
- Locate the charging stations properly with awareness of the type of vehicles to be charged and the location or likely paths of travel of vehicles and persons. Note, impact protection should mitigate not only impact to the equipment but also tire damage to connectors or cables that might be on the ground if not stored or retracted as intended.
- Implement an inspection and reporting system that includes both scheduled inspections and a system allowing users to identify and report damage on charging equipment. This inspection shall at minimum follow the OEM guidelines and include cleaning of all cooling systems vents/filters/etc whether stations are passively or actively cooled.
- Commission (Cx) and re-commission (RCx) station at least every 5 years. Ensure to test new vehicle models planned to be used as these may have different physical sizes that may not allow for positive connector latching or may not properly communicate vehicle state of charge to the units. Cx/RCx should check to ensure insulation testing is successful even with wet connectors and should proceed until the vehicle has reached 100% State of Charge (SoC) and the charging station stops. Grounding checks of the charging station equipment is recommended. For large fleets consider purchasing a testing device such as the Fluke FEV350.

## SITING CONSIDERATIONS AND REQUIREMENTS

Siting considerations are critical to the successful implementation of the EV charging system. Typically, most of the siting requirements are detailed in the OEM documentation, these include setbacks to allow proper cooling and an unobstructed door swing. Cabling limitations, including a limited cable distance and location of power source are other considerations for locating EV charging systems. Additionally, it is recommended to keep a 4ft setback between any doors or panels on the EV charging equipment and any structures as this will meet any AHJ electrical clearance requirements for high voltage equipment without the need to justify whether the equipment could be accessed live/energized. Several listed EV chargers include door sensors to avoid electrical setback requirements but often these door or position switches require an upstream contactor that is not available or is often missed by installers.

Siting considerations to maximize fire safety is something that is evolving with little to no published guidance especially since BEBs have not been found to be more prone to fire and when on fire present a very similar risk that other types of vehicles. Many studies have found that the total energy released is lower, the heat flux and temperatures are similar, and the toxicity of the smoke which is predominantly driven by the plastics used in the bus cab which do not change with fuel type. The guidance that do exist are predominantly local and typically include a means of remote shutdown (i.e. central push button Estop or similar) as well as a requirement that EVs not be charged under occupied areas. The US Government has published a guide titled 'Interim Fire Safety Guidance-EV EVSE Projects-(09.19.23)' which lays out some recommendations that are similar to those applied for stationary batteries, these are generally coordination with local fire officials and a separation distance of at least 25 feet (higher than the 10ft in the Fire Code) between BEBs and occupied or occupiable areas and separation of 10ft to vegetation or other hazardous piles or stock.

Other recommendations based on published guidelines and analysis of early failures include:

- Increase charger to charger distance as a means of futureproofing. This is key as new models (including yearly model refreshes) often change location of cooling inputs/outputs or location of accessible panels. (i.e. when possible do not put units back-back).
- Install oversized and additional conduit including extra 1" communications conduit if communication conduit is not original installed. This allows for installation of higher-powered models and ensures flexibility of the types of Automatic Load Management Systems (ALMS) that can be installed especially when WiFi coverage is not certain.
- Locate bollards, wheel stops, and other means of vehicular impact protection to protect charging station cables or connectors as much as possible. Typically, just extend the locations out to minimize the chance of a wheel damaging the chord or connector that may not have been stored correctly.
- Proper size impact protection considering the vehicle sizes and the direction of traffic

Note since charging has not been found to increase the risk of fire we have not listed any recommendations for fire mitigation in the above list.

## APPLICABILITY FOR SPOKANE REGION & SPOKANE TRANSIT AUTHORITY

EV's, whether fully electric or plug-in hybrid, are the most deployed and mature low carbon options for regional transportation. Given the massive electrification effort of the 20th century, electricity is the most accessible type of transportation fuel, a source of fuel which is consistently being decarbonized as time goes on and as GHG emissions reporting and mandatory reductions laws and or incentives are applied.

## ADVANTAGES & DISADVANTAGES

### Advantages

- Typically, electrified buses (BEBs) are the second most efficient form of transportation, are more aerodynamic, and have the most efficient drivetrains of all available fuel sources.

### Disadvantages

- Some BEBs have a lower range than buses powered by other fuels, requiring more frequent refueling.
- BEBs especially those not fitted with heat pumps have diminished range due to cold temperature as a large fraction of the battery energy is used for heating vs. driving the traction motor.
- Based on STA's experience, BEBs have an initial capital cost up to 50% higher. Additionally, operating costs have been higher, with maintenance hours and expenses exceeding those of ICE fleets and projected to continue doing so. (Note: BEBs are anticipated to be less maintenace than ICE buses as technology advances, as BEBs do not require oil changes, transmission, etc.)

## OPERATIONS & MAINTENANCE (O&M)

Though not STA's current experience, O&M of BEBs is projected to be less than typical ICE buses as they require no oil changes, spark plugs, or transmission fluids, but still require tires, grease, bearings, and brakes, just less frequently (Note: tire life of BEBs in different studies varies some quoting lower tire life but most indicating longer tread life due to improved traction control in EV motors). Some transit authorities and studies have reported that electrified fleets require fewer maintenance bays and a reduced staff, as the reliability of BEBs is ten times higher, resulting in ten times fewer maintenance hours per mile driven. However, this has not been STA's experience, as STA experienced increased maintenance for BEBs vs. ICE fleet vehicles, which may trigger an increase in the need to maintenance bays. Electrified fleets require a different set of skills, at least two technicians should have OEM training on the battery modules, the battery management system, and the software system. Some savings in maintenance staff count may thus be thwarted by the need for technicians with electronics training vs. mechanical, especially in the case of obsolescence.

Obsolescence, while not uncommon for equipment operating on multiple fuels, does seem more prevalent for BEBs, especially earlier models produced by new unknown OEMs with little funding and little industry experience which made them more prone to bankruptcy. Several fleet operators, especially early adopters in the 1990s-2000s purchased BEBs from OEMs that are no longer in business forcing fleet operators to take on traditional specialized OEM maintenance tasks such as software/firmware updates and replacement of failed battery modules within battery packs.

Due to the potential for obsolescence but also due to potential savings from having an onsite area for OEMs to perform warranty repairs without the need for specialized costly transportation, it is recommended that any site with more than 20 BEBs consider having a maintenance bay setup for removal and testing of battery packs. This would include a jack with capacity for at least 150% the weight of the heaviest pack, a bund tank to capture battery coolant spills when batteries are removed, and a fire rated boundary to enclose the BEB specific maintenance bay in case of fire during battery replacements and offer safe fire-rated interim storage for the damaged/faulty battery modules post removal.

## COST CONSIDERATIONS

BEB's have a higher upfront capital cost than comparable ICE buses. STA's experience for upfront capital cost in addition to the bus cost directly has included costs associated with, and retrofitting maintenance bays and upgrading electrical infrastructure. These improvements can cost millions of dollars. However, with proper planning, these investments can be shared with other parties, offset through available incentives, or significantly reduced by effective and creative engineering solutions. Some cost mitigation options include:

- Modifying deployment and equipment selection to match grant and incentive rules.
- Changing charging and route times to reduce the need for high power charging, this includes potentially applying mid-route charging whether wired or wireless.
- Implementing an ALMS system to lower loads and to apply smart charging.
- Considering the cost benefit of systems like heat pump space heaters, and more efficient traction motors vs. increased infrastructure costs to accommodate less efficient BEBs.
- Properly evaluating the impact of larger than needed BEB batteries, while there could be an impact on efficiency and tire life, larger BEBs could last exponentially longer.
- Microgrid integration: If buses are connected through a local microgrid, a facilities resiliency can be increased when grid power is down.

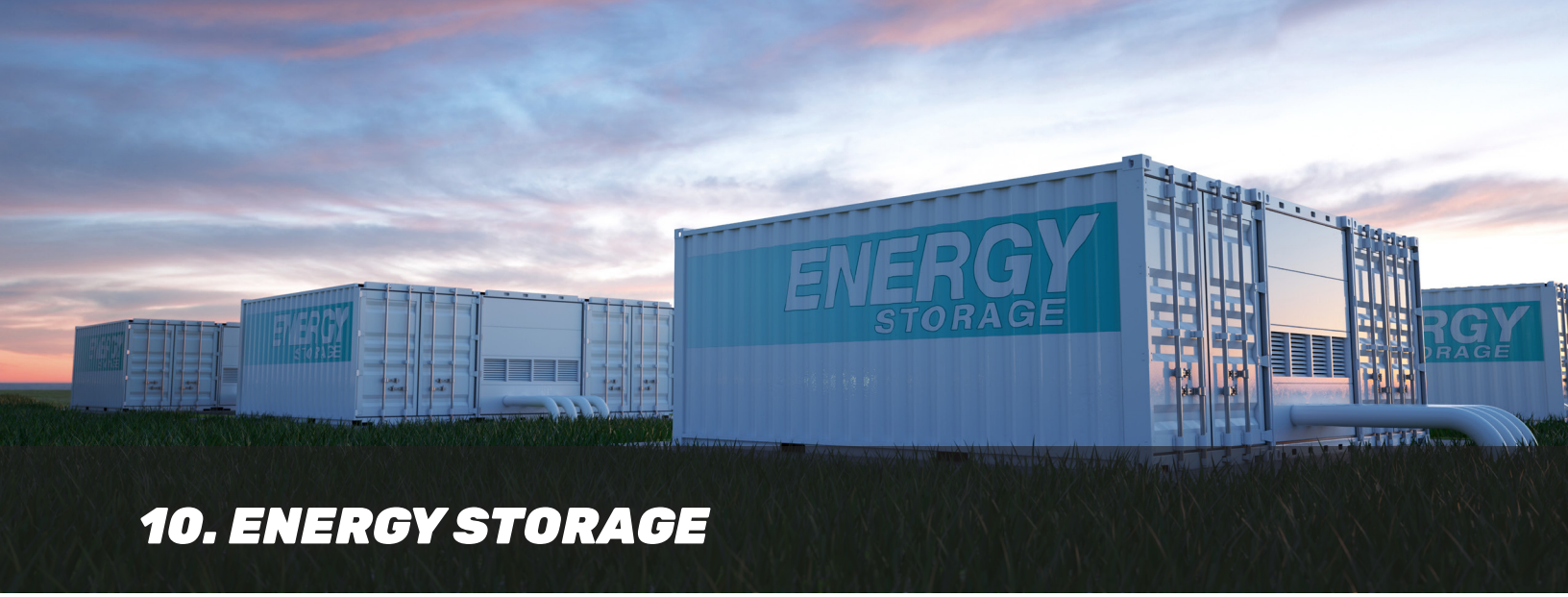
The other benefit of BEB vehicles is the ability to "fuel" them with onsite fuel creation. By adding PV to the roof or canopies of the facility, electrical costs for charging can be significantly reduced. Some areas have also achieved cost savings by selling power back to the utility when the buses are not in use, with the battery serving as a grid storage resource. Multiple large utilities in the U.S. are incentivizing this integration.

# 10

# Energy Storage



COFFMAN ENGINEERS




# 10. ENERGY STORAGE

## INTRODUCTION

Energy storage refers to a range of systems that allow energy to be captured at one time, stored, and discharged at a later time to address imbalances in supply and demand, or produce additional power when the need for immediate consumption does not exist (reduce curtailment impacts). Stored electricity can be from renewable sources, or non-renewable sources on the grid. This decoupling of generation and consumption has wide-ranging applications (or "use cases") for utilities and consumers, including renewable penetration, resource adequacy, energy arbitrage, T&D upgrade deferral, transmission congestion relief, demand charge reduction, and overall system reliability.

Energy Storage Systems (ESS) are generally grouped into five main categories associated with the primary mechanism of conversion, as shown below, together with example technologies within each.

| Electrical | Electro-Chemical | Mechanical | Thermal | Chemical |
|---|---|---|---|---|
| Supercapacitors | Lithium-Ion | Flywheel | Molten Salt TES | Hydrogen |
| Superconducting magnets | Flow (Vanadium, Organic, etc.) | Pumped Hydro | Cryogenic | Natural Gas |
| | Metal-Air (Iron, Zinc) | Compressed Air (CAES) | Phase Change Materials (PCM) | Methane |
| | Nickel-Metal Hydride | Gravity Systems | Granular Solid | Ammonia |
| | Nickel-Cadmium | Buoyancy Systems | | |
| | Sodium-Sulphur | | | |
| | Lead-Acid | | | |

Electro-chemical storage (and more specifically, rechargeable batteries) are the category of the second most deployed systems behind mechanical (due to the worldwide adoption of pumped hydro). (Note: In the US, battery storage is expected to overtake pumped hydropower in 2025). Each of these ESS have different characteristics, such as energy density, response, cost, and other factors, leading to some being more or less suitable to certain applications. Electro-chemical storage systems, like lithium-ion, lead-acid, metal-air, and flow batteries all store electrical energy in chemical bonds. Currently, Lithium-ion are the most widely used ESS used for stationary (utility) and mobile (e.g., EV, drones, etc.) applications, mostly driven by relatively high power-to-weight ratio, combined with a relatively low cost per kWh, or levelized cost of storage (LCOS).

ESS systems are also further classified in terms of duration (i.e., the time over which a system can sustain the maximum power output). Long Duration Energy Storage (LDES) refers to system of 10+ hours in duration, whereas Multi-Day Storage refers to 24+ hours. Some other designations include Seasonal storage and Medium Storage. The definition of what qualifies as LDES is currently disputed, with some industry stakeholders defining it as 4+ hours, some preferring 8+, or longer.

For this discussion, we will describe in further detail only lithium-ion batteries, given their wide adoption for utility-scale storage and expected application by STA, however STA may consider also metal-air, zinc-bromide, and vanadium redox flow batteries as alternative solutions, depending on desired duration, available footprint, and other factors.

In lithium-ion batteries the oxidation-reduction reaction takes place as lithium ions migrate between an anode, and a cathode through a permeable membrane, in the presence of an electrolyte. Lithium ion batteries presently dominate the energy storage sector for stationary applications because they are relatively light weight, have high energy density, are relatively easy to deploy using standard engineering and construction techniques, and can be incorporated into existing grid infrastructure. Lithium-ion battery cells are manufactured in a wide range of shapes and sizes; however, all have a similar setup of being encased in a hermetically sealed pouch or enclosure and contain anode and cathode sheets surrounded by electrolyte.

Most lithium-ion energy storage batteries deployed today for grid storage utilize either Lithium-Iron-Phosphate (LFP) or Lithium-Nickel-Manganese-Cobalt (NMC). NMC typically has a higher energy density than LFP and lower self-heating rate; however, LFP is considered by some to have a slightly better performance on safety factors and cycle duration/lifespan.

## SAFETY & HAZARD CONSIDERATIONS

Lithium-ion batteries utilize cells connected together to comprise battery modules. Multiple modules are electrically connected to comprise a rack. Multiple racks may be connected or grouped to comprise an enclosure or cabinet, or sometimes are installed as racks in a building. The battery cells are hermetically sealed, and under normal conditions, these batteries do not leak or produce gasses. These batteries, however, do produce heat during normal operation, both during charging and discharging. During an abnormal condition known as Thermal Runaway, or TR (which is triggered by mechanical abuse, thermal abuse, or dendrite formation) these cells can produce extensive chemical heat and combustible gases, which can subsequently result in a fire and/or an explosion. Significant amounts of water will not stop this chemical reaction, and manufacturers have developed passive enclosure designs to limit the size of fire.

For ESS over 20 kWh the fire code has significant requirement for fire monitoring, technical expert review of manufacturer literature, and explosion preventions. The code requirement varies significantly between outdoor non-walk-in enclosures and indoor battery racks. Due to the significant risk to occupants of a building, Coffman generally does not recommend putting more than 600 kWh of batteries in a mixed occupancy building.

- Fire Alarm Aggregation / FACP / FCC
- On-Site Fire Water / Tanks / Hydrants / AHJ preferences
- Automatic notification
- Hazard Mitigation Analysis
- Emergency Response Plan
- UL9540 Listing & Testing
- Fire Detection

## SITING CONSIDERATIONS AND REQUIREMENTS

Assuming more than 600 kWh of energy storage is desired on a site, an outdoor non-walk-in enclosure is the typical solution. These enclosures are required to be located at least 10-feet from adjacent buildings, lot lines, and public ways. In addition, the equipment needs to be secured via a fence/wall to prevent public access. 600 kWh is the typical threshold a single BESS unit for commercial scale microgrid with grid connect would support. BESS and kWh capacity can be further evaluated under the next stage of the Facilities Master Plan and Clean Energy Campus design.

Most commercially available systems on the market today intended for utility scale or C&I applications are in non-walk-in outdoor enclosures, sometimes ranging from 2MWh to 6MWh in energy capacity per enclosure. Systems intended for small, and/or Behind the Meter (BTM) systems may be smaller ranging from 100kWh to 500kWh per cabinet. Rows of cabinets or enclosures can be arranged and electrically connected for the desired energy and power capacities. For larger systems, siting and layout considerations include:

- Fire Department access roads per IFC (or other applicable code), with a minimum of 20' wide, but preferably 26' wide.
- Ring road for Fire Department access and defensible space.
- Setbacks of at least 30' and possibly up to 100', depending on technology, size, and location.
- Non-combustible BESS yard (e.g., gravel) inside the fence line, with no vegetation.
- Fencing.

Lithium-ion batteries (LIBs) have a limited life – both in terms of cycle life and calendar life. Typical cycle-life for LIBs can be up to 8000 cycles, after which significant degradation may be present, effectively limiting the energy capacity of the battery. Degraded batteries also may have a higher heat generation during charge and discharge for a unit kWh, and may also be more susceptible to thermal runway. LIB systems designed for a constant power output over, say, 20 years, compensate for this degradation with augmentation. Augmentation includes adding new batteries at planned intervals after Commercial Operations Date (COD). This leads to some systems being described as having BOL (Beginning of Life) and EOL (End of Life) characteristics.

## ADVANTAGES & DISADVANTAGES

### Advantages

- Commercially available
- Wide range of sizes, configurations
- Reputable OEMs, track record
- Significant power per unit footprint
- Easily integrated into microgrid and other systems

### Disadvantages

- Specific FD requirements
- Potential permitting complexities
- Additional FD evaluations (HMA, ERP, etc.)
- Preferrably outdoor installations
- Fencing from unsecured access, 10' separations

The recommended next step in evaluating cost-effectiveness and benefits for STA is to conduct a cost-benefit analysis that builds on the technology cost comparison presented herein. This analysis should incorporate a solar generation model based on STA's specific energy usage and Avista/Utility rate data to assess the potential return on investment for PV and energy storage assets. It will also include an integrated microgrid. The findings from this evaluation will be developed and integrated into the next phase of the Master Plan and Clean Energy Campus design development.

# 11

# Fuel Cells



COFFMAN ENGINEERS

# 11. FUEL CELLS

*Image Courtesy of Bloom Energy*



## INTRODUCTION

A fuel cell produces DC power by using hydrogen or natural gas as fuel. The working principle in the fuel cell is an electro-chemical reaction between hydrogen gas and oxygen from the air in the presence of a catalyst and does not include any moving parts and results in only water vapor as the tailpipe emission. Natural gas fuel cells require additional fuel processing to achieve the same process as and are more carbon intensive than hydrogen fuel cells, though carbon emissions are less than an equivalent kW or MW size diesel genset.

### SAFETY & HAZARD CONSIDERATIONS

Prepackaged fuel cell power systems shall be listed and labeled in accordance with CSA FC 1.

Indoor installations shall comply with the following:

- **Building Separation** - Where installed indoors, they need to be separated with fire rated construction (1-hour or 2-hour depending up on occupancies).
- **Gas Detection** - A gas detection system shall be provided in approved locations in the fuel cell power system enclosure, the exhaust system, or the room that encloses the fuel cell power system.
- **Fire Sprinkler Systems** - Indoor liquid fuel pumps shall be protected by an automatic fire suppression system.

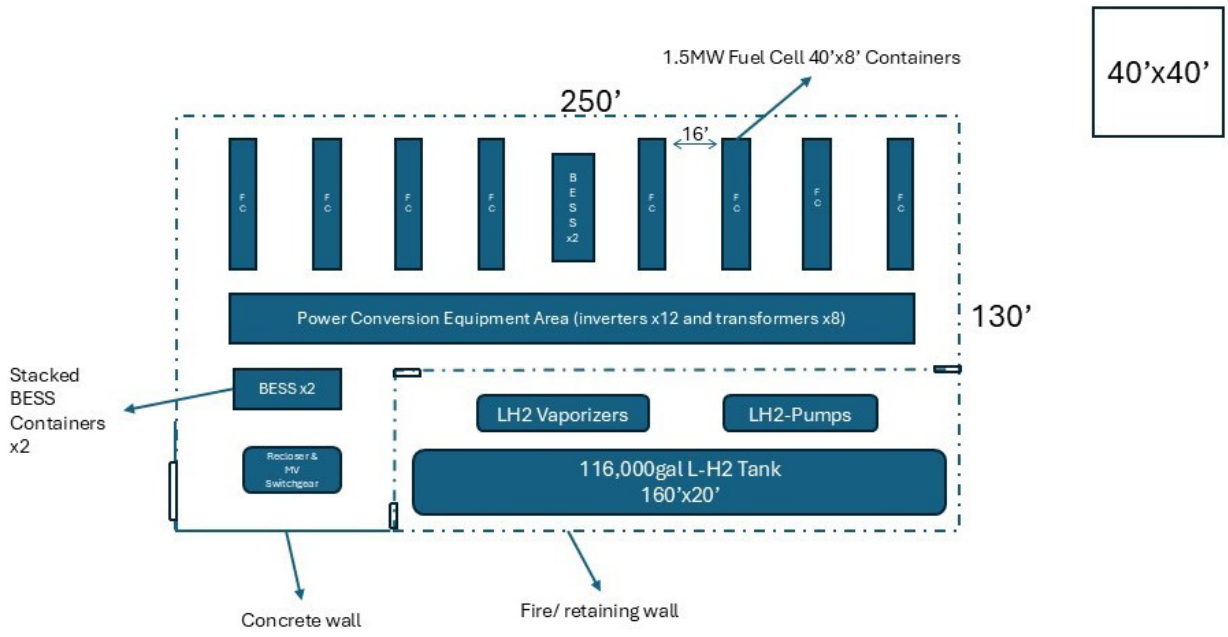
Outdoor installations shall comply with the following:

- **Setback/Separation** - Stationary fuel cell power systems shall be separated by not less than 5-feet from lot lines, public ways, buildings, and other exposure hazards.
- **Fire Hydrants** - Sites that have flammable or combustible liquid fuel storage shall have fire hydrants.

### OPERATIONS & MAINTENANCE

- Low overall maintenance cost due to the electrochemical process compared to the mechanical process in combustion-based generators
- Excellent energy management and load following capabilities
- Autonomous uninterrupted operation of up to months

## SITING CONSIDERATIONS AND REQUIREMENTS




**Indicative layout for a 12MW Fuel Cell power plant with a 116,000g liquid hydrogen tank sufficient for 48hr uninterrupted backup power (12MW/ 576MWh)*

## APPLICABILITY FOR SPOKANE REGION & SPOKANE TRANSIT AUTHORITY

A long-duration storage option to supply uninterrupted clean power for BEB fleet.

## ADVANTAGES & DISADVANTAGES

### Advantages

- Significant storage duration (days to months)
- Low noise
- No tailpipe emission
- Can generate zero-emission power if clean hydrogen (blue or green hydrogen) is used

### Disadvantages

- Safety requirements tend to increaser the overall project cost
- Clean hydrogen availability and cost

## COST CONSIDERATIONS

Power produced in a fuel cell tends to be expensive due to the high cost of equipment and hydrogen fuel. A 10MW fuel cell system is estimated to cost around $1,800-$2,000 per kW for PEM fuel cell technology (~$450/kW for diesel gen set). This cost is expected to come down in coming years as the technology matures and manufacturing capacities expand.

Fuel cost accounts for most of power production cost in a fuel cell. Current retail price of unabated hydrogen (grey hydrogen) at the point of delivery ranges between $3-$5 per kilogram. Green hydrogen prices tend to be significantly higher, typically in the $6-$11 per kilogram range, with DOE H2D1 supporting the goal of down-the-line delivery cost of $7 per kilogram. At hydrogen price of $7 per kilogram, the fuel cost portion of power from fuel cell will be $250-$300/MWh. Green hydrogen prices are expected to come down in coming years by building more production capacity and infrastructure.

# 12

# Other Non-Diesel Genset Back-Up Power Options (NG and RNG Genset)



COFFMAN ENGINEERS

# 12. OTHER NON-DIESEL GENSET BACK-UP POWER OPTIONS (NG AND RNG GENSET)

## INTRODUCTION

To support STA's facility electrical service resilience and sustainability, natural gas and renewable natural gas gensets can be considered. This would be an option for STA facilities to have back-up power served by a natural gas service to support facility critical load and BEB / ZEB charging during a power outage.

### ADVANTAGES & DISADVANTAGES

#### Natural Gas (NG) Generator and Fuel Cells

Natural gas based gensets can provide a low-cost option for supplying dispatchable power.

**Advantages:**

- Small physical footprint
- Quick installation
- Near-instantaneous response times
- Virtually no operational constraints (e.g., no minimum run times and extremely fast ramp rates)
- Long duration storage option (by upsizing the NG storage vessel) or using the existing gas utility system
- **Fuel Cells:** Less maintenance than NG generators as they have no moving parts

**Disadvantages:**

- CO2 emissions
- CO/ NOx/ VOC and particulate emissions

#### Renewable Natural Gas (RNG) Generator and NG Fuel Cells

Similar to NG Generator option but uses RNG which could potentially generate CO2-negative power depending on the source of RNG used. The use of RNG converts the methane gas from the landfill into the CO2 which would be released into the atmosphere otherwise which significantly higher greenhouse gas effect than the CO2 (~28 times).

**Advantages:**

- All advantages of NG Generator
- Potentially negative CO2 emission

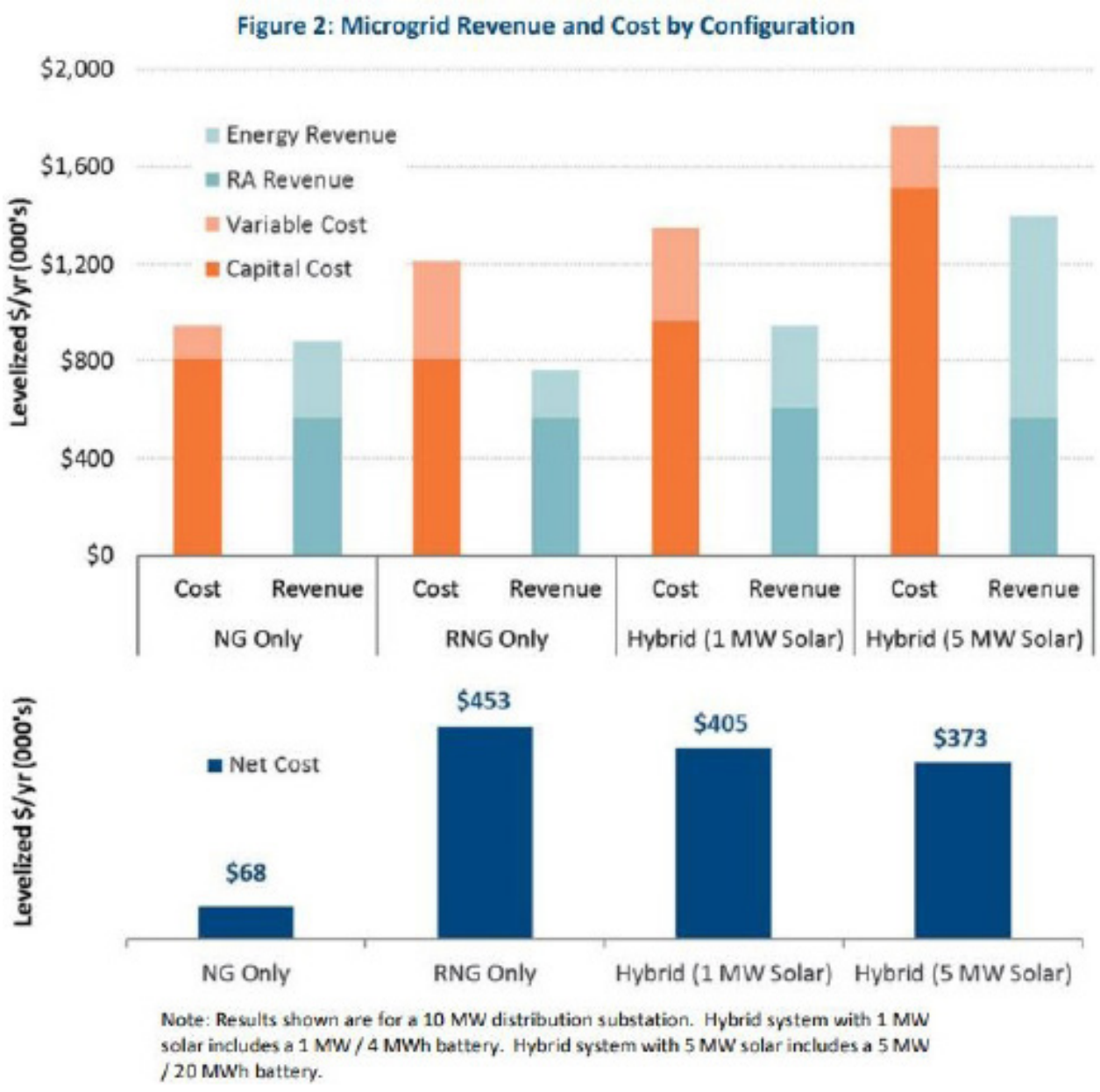
**Disadvantages:**

- Sourcing of RNG fuel and potential high cost
- CO/ NOx/VOC and particulate emissions

## COST CONSIDERATIONS

| Cost Type | RNG-Based Generator | NG-Based Generator |
|---|---|---|
| NG Generator Installed Cost | $1300/kW | $1300/kW |
| Fuel Price | $15/MMBtu | $8/MMBtu |
| Fuel Cost @ 40% Eff. | $128/MWh | $68/MWh |
| Genset O&M Costs | $10/MWh | $10/MWh |
| Total O&M + Fuel Cost | $138/MWh | $78/MWh |

**Estimated production cost of backup power using (R-)NG based engine (12MW)*




*Source: [Decarbonized Resilience, Assessing Alternatives to Diesel Backup Power (2020)]*

**RA: The resource adequacy (RA) price is based on data published by the California Public Utilities Commission (CPUC) reflecting the results of recent RA contracts in California.*

# 13

# Microgrids



COFFMAN ENGINEERS

# 13. MICROGRIDS

## INTRODUCTION

The term ''Microgrid' refers to a power system that is local to a specific area, controllable, and is able to operate independently of the wider grid. Many microgrids are grid-connected, but all have the capability of self-generating the power needed to meet the local demand. Microgrids can be powered by any available source, including fossil fuel-fired generators, hydropower, wind, batteries, solar or biomass, and often combine multiple generation assets of different types.

The infrastructure associated with a microgrid would be familiar to those familiar with power system design or operations. This can include switchgear with motorized breakers, transfer switches, PLC-based controllers, synchronizing and load-sharing generator controls, protective relays, communications with the utility or other remote entities.

### SAFETY & HAZARD CONSIDERATIONS

Microgrids are a generally control platforms that allow for efficient dispatch of generating assets, control of electrical loads, and synchronization with or decoupling from the grid. The controls are typically packaged into UL-listed enclosures that present similar hazards to comparable electrical gear that may be serving as a building service, standby generator control cabinet or switchgear lineup. There are no specific safety or hazard considerations separate from general electrical safety. Depending on the generation resources and associated fuel storage that may be part of a particular microgrid, additional safety considerations may need to be considered.

### SITING CONSIDERATIONS AND REQUIREMENTS

Clearances to microgrid equipment is the same as for other operable electrical equipment, 36" or greater depending on the voltage.

### APPLICABILITY FOR SPOKANE REGION & SPOKANE TRANSIT AUTHORITY

Microgrid controls are commercially available from a wide range of suppliers, and for a wide range of applications. Some of the more common applications for microgrid controls include

- Improving resiliency when the utility grid is down
- Risk mitigation for loss of product or service
- Firming of renewable energy
- Mitigating high cost of power
- Overcoming timelines or capacity restrictions on new utility services
- Reducing carbon footprint

# 14

# Photovoltaic (Solar)



COFFMAN ENGINEERS

# 14. PHOTOVOLTAIC (SOLAR)

## INTRODUCTION

Photovoltaic (PV) systems have become ubiquitous with renewable energy and energy conservation policies thanks to their relative affordability, and simple integration into a facility. For most commercial and industrial applications rooftop solar systems have been preferred thanks to their ability to utilize previously un-utilized space on building rooftops, parking lot canopies, and more.

### CODE CONSIDERATIONS

Washington state energy code currently requires the installation of a photovoltaic system for commercial facilities of this type and size. Future codes will continue to increase the amount of PV generation required.

### SAFETY & HAZARD CONSIDERATIONS

The Washington State Fire Code for roof-mounted photovoltaic (PV) panels on commercial buildings includes the following requirements:

- **Size** - PV arrays must be no larger than 150 feet by 150 feet in either direction.
- **Clear Perimeter** - If either axis of the building is more than 250 feet, there must be a clear perimeter of at least 6 feet around the roof's edges. If either axis is 250 feet or less, there must be a clear perimeter of at least 4 feet.
- **Access Pathways** - There must be clear access pathways between arrays that are at least 3 feet wide to allow the fire department to perform smoke ventilation operations.

For ground mounted photovoltaic arrays, a brush-free area of 10 feet (3048 mm) is required around the perimeter per the fire code.

### SITING CONSIDERATIONS AND REQUIREMENTS

- Roof mounted PV provides the benefit of no additional land use.
- Structural and architectural considerations will be needed to ensure load design and roofing construction are appropriate for solar installation.
- Rooftop equipment locations could trigger fall protection requirements.
- Rooftop solar requires a rapid shutdown system and disconnect point readily accessible to fire department.

## APPLICABILITY FOR SPOKANE REGION & SPOKANE TRANSIT AUTHORITY

- Basic system requirements to comply with the Washington state energy code.
- Improved building performance and efficiencies for compliance with the clean buildings act.
- Most effective when paired with a battery storage system.

## ADVANTAGES & DISADVANTAGES

**Advantages:**

- Lower utility costs
- Energy independence
- Low maintenance costs

**Disadvantages:**

- Increased structural construction costs to support equipment loads

## OPERATIONS & MAINTENANCE

- Minimal maintenance required
- Panels should periodically be cleared of dust, debris, and snow for optimal performance
- Can contract with local manufacturer's representatives for equipment servicing

## COST CONSIDERATIONS

A code compliant PV system based on minimum sizing to achieve compliance may not provide optimal utility savings and system pay back. Solar generation modeling, utilizing customer energy usage data, paired with utility rate information and interconnection offerings, is recommended for determining an ideal system size and layout. There is an additional savings potential when paired with battery storage and/or microgrid solutions.

Snow mitigation is limited to manual maintenance, while there are some on-the market solutions to prevent snow and ice accumulation which would require an additional upfront cost. Manually clearing of snow is anticipated as part of the long term maintenance of the PV panels. Other Installation considerations to limit snow and ice accumulation on panels include siting and installations considerations, including placement, angle of panels. external heating solutions, panel coatings, and other emerging solutions.

The recommended next steps in evaluating cost-effectiveness and benefits for STA involve conducting a solar generation model using STA's specific energy usage and Avista/Utility rate data to analyze the potential return on investment for PV. This analysis should also include an option with an integrated microgrid. The findings from this evaluation will be developed and incorporated into the next phase of the Master Plan and Clean Energy Campus design development.

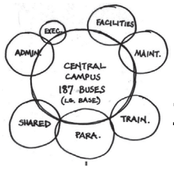
# END OF REPORT

# 7.0 APPENDIX

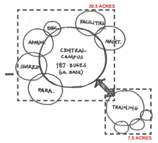
## IV. FUTURE OPERATIONS MODELS ANALYSIS

### SUPPLEMENTAL INFORMATION

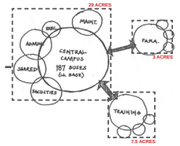
# FUTURE OPERATIONS MODELS ANALYSIS
## SCENARIOS EXPLORED



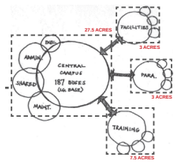

1. LARGE BASE / CENTRAL CAMPUS



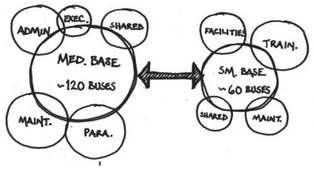
1A. TRAINING CAMPUS



1B.TRAINING + PARATRANSIT CAMPUS

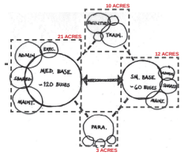


1C.TRAINING + PARA. + FACILITIES CAMPUS

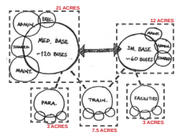



2. DUAL CAMPUS

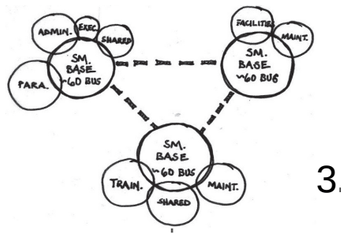
2A.TWO EVENLY SPLIT CAMPUSES



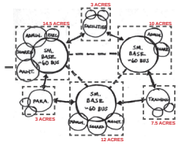
2B.FACILITIES/TRAINING + PARA. CAMPUS



2C.TRAINING + PARA. + FACILITIES CAMPUS




3. NETWORK



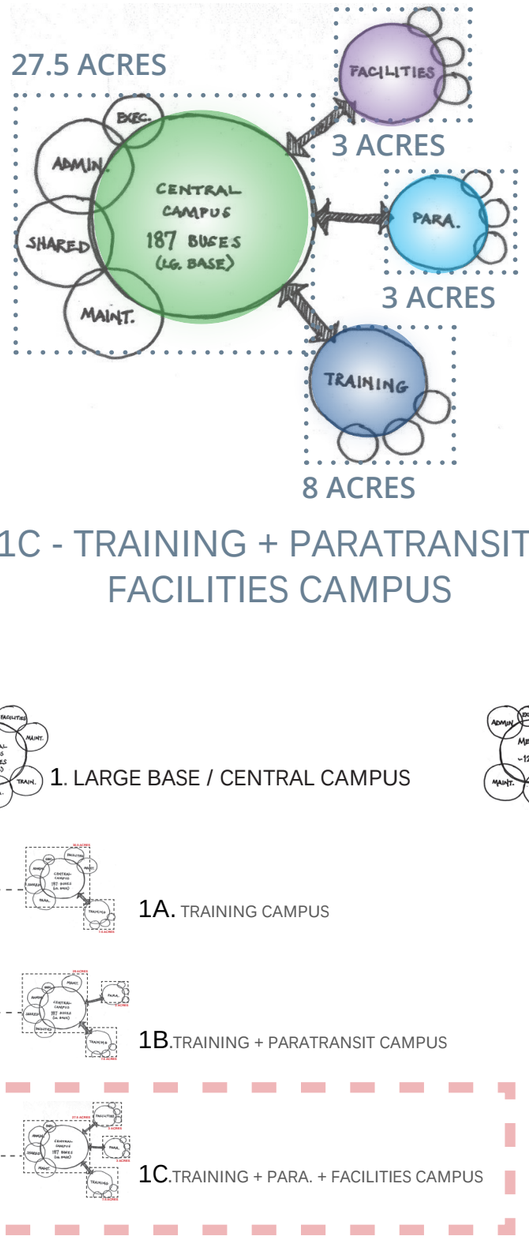
3A.TRAIN./PARA./FACILITIES HUBS

3B.HOME BASE + NETWORK

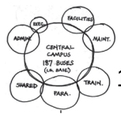
3C.DISTRIBUTED NETWORK

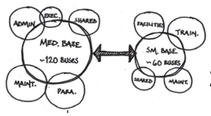
# PROSPECTIVE OPERATION MODELS
## 1C- ONE LARGE CAMPUS AT BOONE

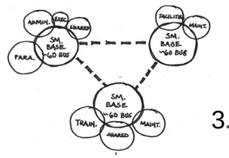
41.5
ACRES




## 1C - TRAINING + PARATRANSIT + FACILITIES CAMPUS


1. LARGE BASE / CENTRAL CAMPUS


2. DUAL CAMPUS


3. NETWORK

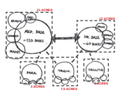

1A. TRAINING CAMPUS


1B.TRAINING + PARATRANSIT CAMPUS


1C.TRAINING + PARA. + FACILITIES CAMPUS


2A.TWO EVENLY SPLIT CAMPUSES


2B.FACILITIES/TRAINING + PARA. CAMPUS


2C.TRAINING + PARA. + FACILITIES CAMPUS

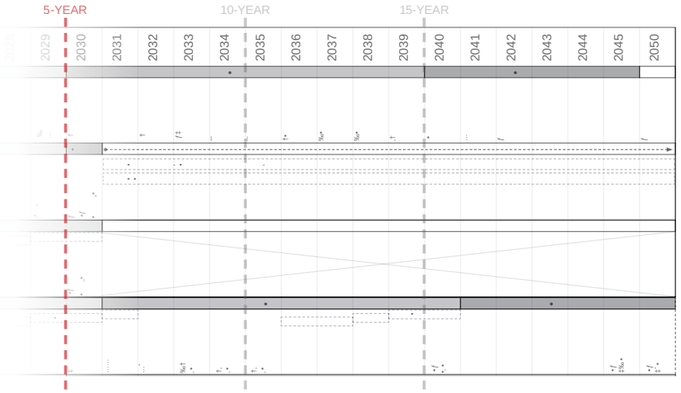

3A.TRAIN./PARA./FACILITIES HUBS


3B.HOME BASE + NETWORK

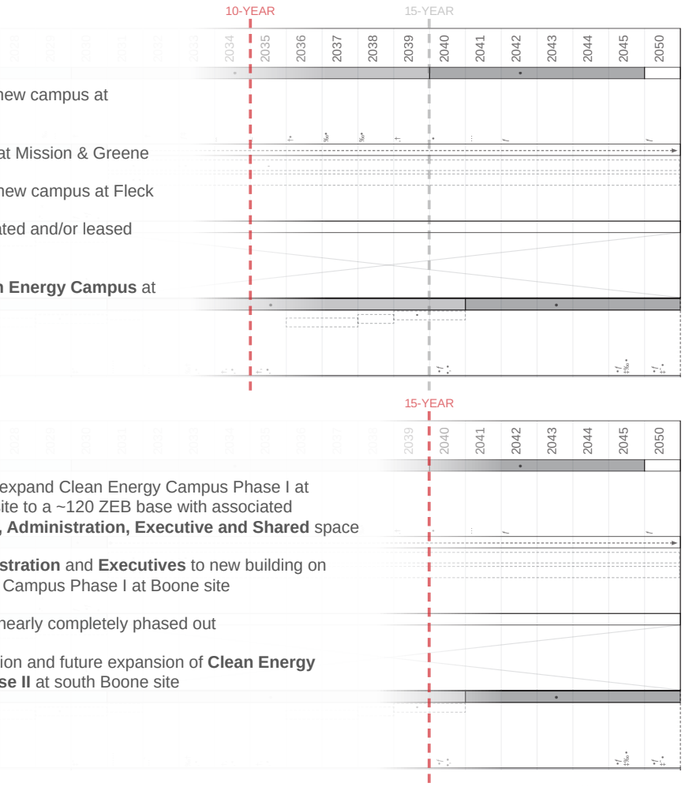

3C.DISTRIBUTED NETWORK







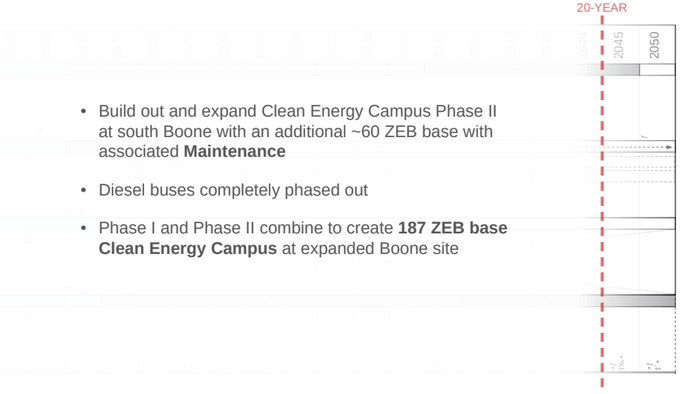

- Acquire approximately 3 acre site for **Paratransit**
- Build **new Training facility** at Mission & Greene
- Renovate and build out Fleck site for **Facilities & Grounds**
- Acquire adjacent Boone Street properties for **future expansion**
- Renovate Plaza office space and/or secure adjacent lease space for **Administration**




- Build and move **Paratransit** to new campus at acquired site
- Move **Training** to new campus at Mission & Greene
- Move **Facilities & Grounds** to new campus at Fleck
- Move **Administration** to renovated and/or leased office space at Plaza
- Begin future expansion of **Clean Energy Campus** at north Boone site



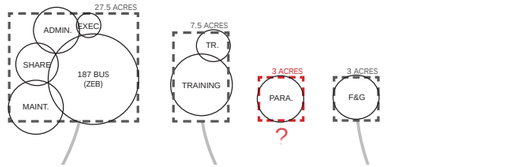

- Build out and expand Clean Energy Campus Phase I at north Boone site to a ~120 ZEB base with associated **Maintenance, Administration, Executive and Shared** space
- Move **Administration** and **Executives** to new building on Clean Energy Campus Phase I at Boone site
- Diesel buses nearly completely phased out
- Begin renovation and future expansion of **Clean Energy Campus Phase II** at south Boone site




- Build out and expand Clean Energy Campus Phase II at south Boone with an additional ~60 ZEB base with associated **Maintenance**
- Diesel buses completely phased out
- Phase I and Phase II combine to create **187 ZEB base Clean Energy Campus** at expanded Boone site

# FUTURE OPERATIONS MODELS ANALYSIS

## 1C - ONE LARGE CAMPUS AT BOONE



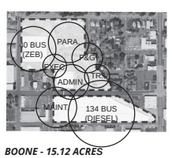

BOONE - 15.12 ACRES

FAIRGROUNDS - 11.26 ACRES

MISSION & GREENE - 5.95 ACRES

PLAZA

FLECK - 3.3 ACRES




BOONE - 15.12 ACRES

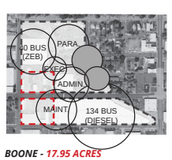

FAIRGROUNDS - 11.26 ACRES

MISSION & GREENE - 5.95 ACRES

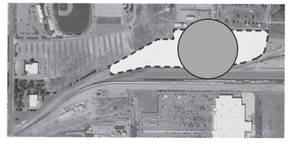
PLAZA


FLECK - 3.3 ACRES

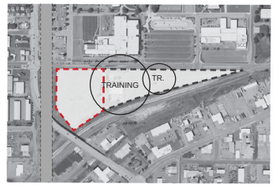
### CURRENT STATE




BOONE - 17.95 ACRES



FAIRGROUNDS - 11.26 ACRES



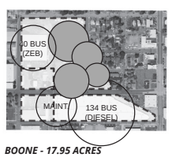

MISSION & GREENE - 11.49 ACRES

PLAZA

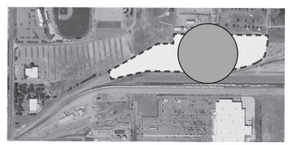

FLECK - 3.3 ACRES

NEW SITE ~3 ACRES

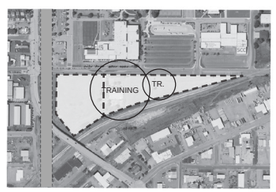
### 5-YEAR PLAN (2030)




BOONE - 17.95 ACRES



FAIRGROUNDS - 11.26 ACRES



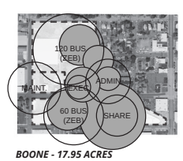

MISSION & GREENE - 11.49 ACRES


PLAZA

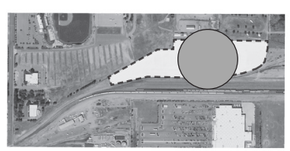

FLECK - 3.3 ACRES


NEW SITE ~3 ACRES

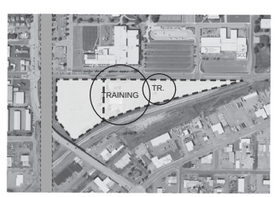
### 10-YEAR PLAN (2035)




BOONE - 17.95 ACRES



FAIRGROUNDS - 11.26 ACRES




MISSION & GREENE - 11.49 ACRES

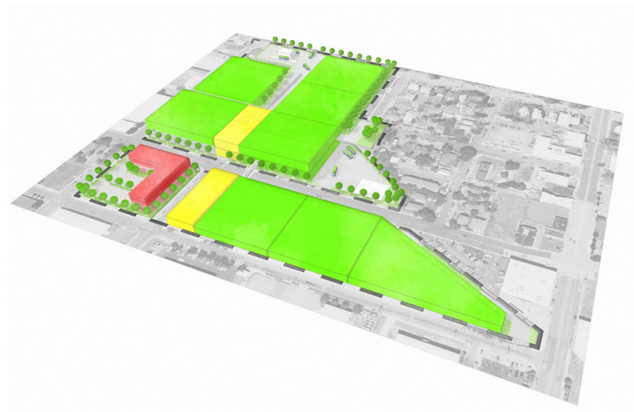
PLAZA


FLECK - 3.3 ACRES


NEW SITE ~3 ACRES

### 20-YEAR PLAN (2045)





## ASSUMPTIONS:

- Acquisition of 1300 Block (between Adams and Cedar) on north side of Boone
- Acquisition of Spokane County property / 1300 Block on south side of Boone
- Vacation of Adams St. north of Boone, and Sharp Ave. west of Jefferson St.
- Demolition of 1212 Sharp and North Boone (1230 Building)
- Stacking of program and structured parking required on north Boone site
- Acquisition of WSDOT property after completion of NSC, and vacation of Thor Ct. at Mission & Greene
- Existing Fleck program relocated and facilities retrofitted/expanded for F&G
- Fairgrounds site unused/available for land swap or other...

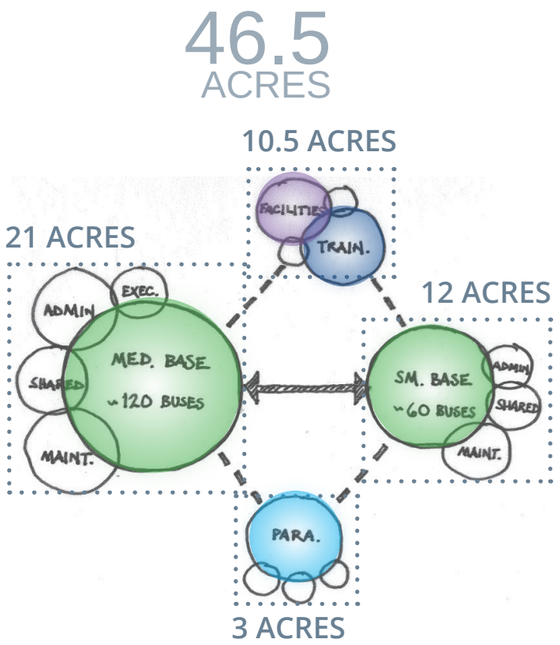
## OPPORTUNITIES:

- ALSC/Coffman: New training facility in ~5 years
- ALSC/Coffman: Relatively small new site required
- ALSC/Coffman: Single campus in central location
- ALSC/Coffman: De-couples Paratransit
- STA: Like the concept of a centralized campus, or Boone as the primary campus
- STA: Like the idea of acquiring adjacent properties at Boone

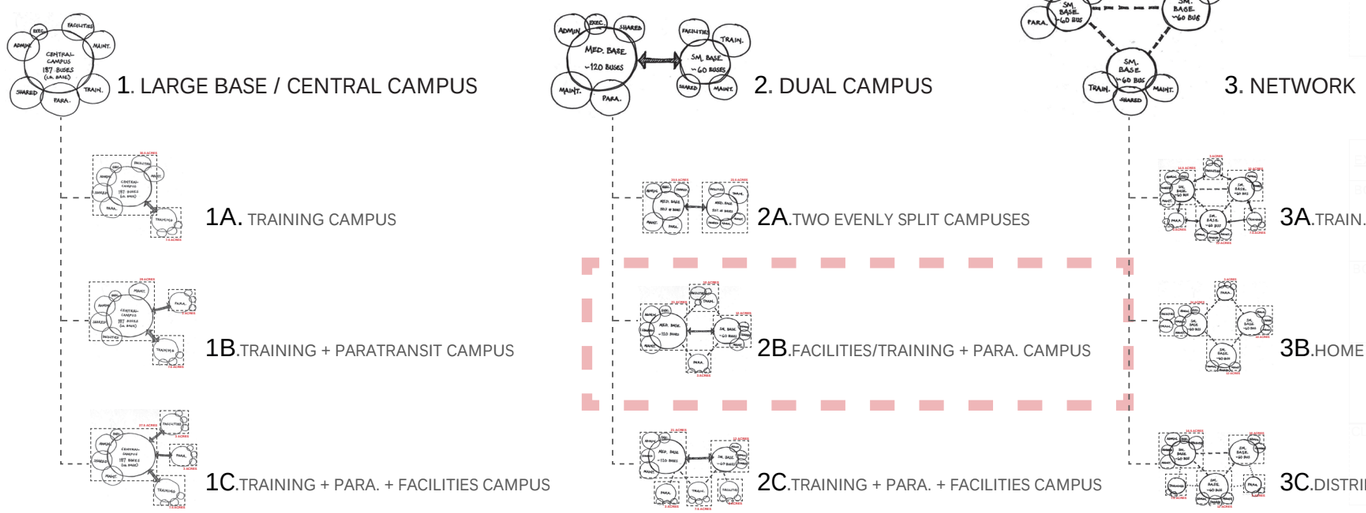
## CHALLENGES:

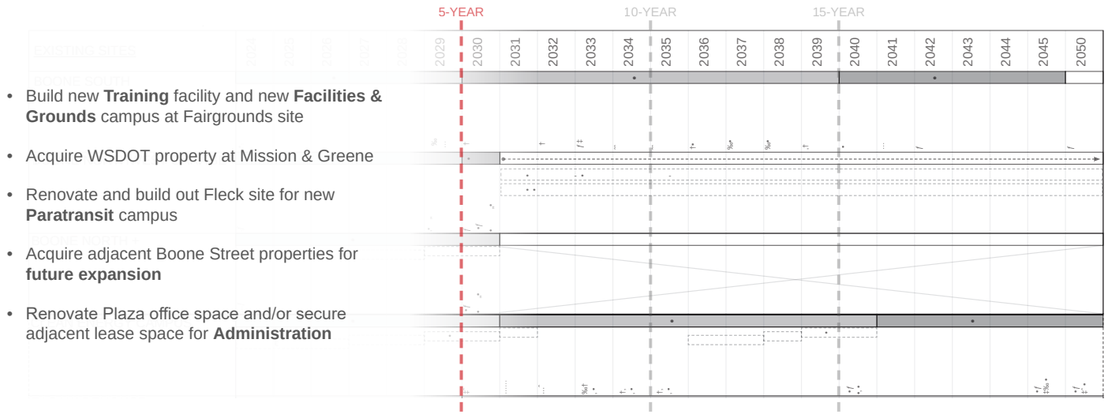
- **ALSC/Coffman: New bus storage 10-15 years out**
- ALSC/Coffman: Potential zoning issues at Boone
- ALSC/Coffman: Stacking of program required
- ALSC/Coffman: Renovating south Boone to ZEBs
- ALSC/Coffman: 20 years to full build-out
- STA: Tough time seeing the reality of this option with STA's size - lots of construction/density on Boone
- STA: Zoning and neighborhood challenges with placing buses near residential on North Boone
- STA: Does not maximize the use of the Plaza

# FUTURE OPERATIONS MODELS ANALYSIS
## 2B - DUAL CAMPUS

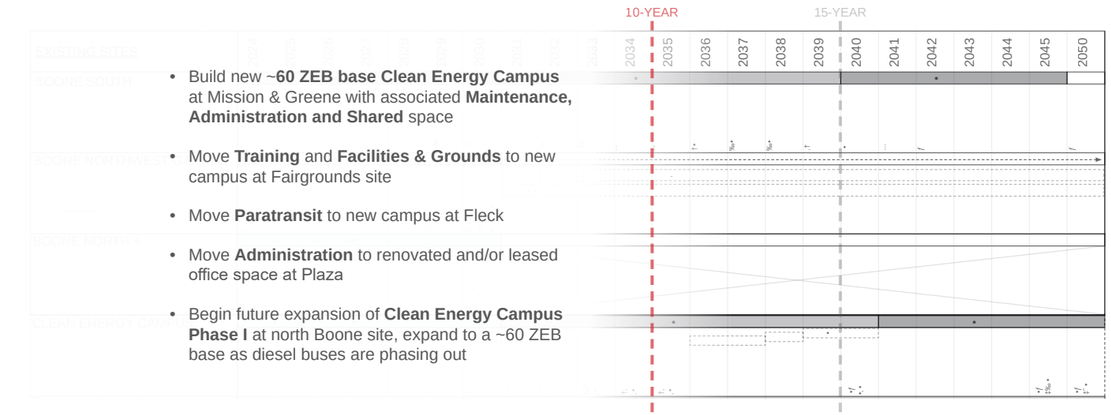



2B - FACILITIES/TRAINING + PARATRANSIT CAMPUS

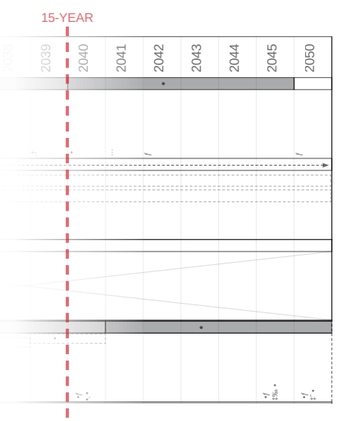



- Build new **Training** facility and new **Facilities & Grounds** campus at Fairgrounds site
- Acquire WSDOT property at Mission & Greene
- Renovate and build out Fleck site for new **Paratransit** campus
- Acquire adjacent Boone Street properties for **future expansion**
- Renovate Plaza office space and/or secure adjacent lease space for **Administration**



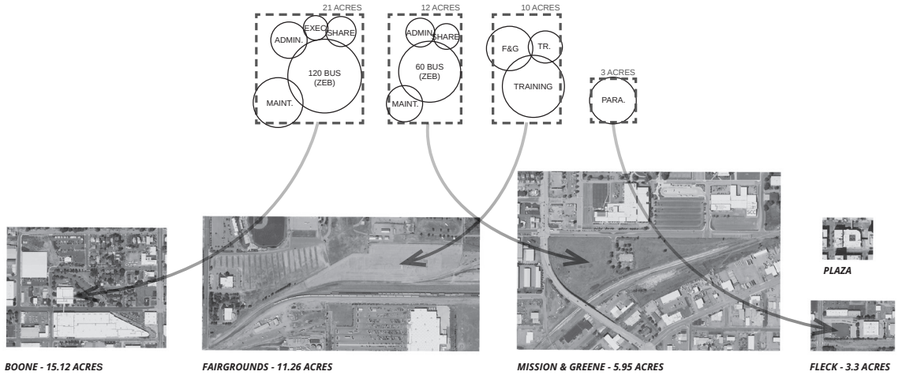

- Build new ~**60 ZEB base Clean Energy Campus** at Mission & Greene with associated **Maintenance, Administration and Shared** space
- Move **Training** and **Facilities & Grounds** to new campus at Fairgrounds site
- Move **Paratransit** to new campus at Fleck
- Move **Administration** to renovated and/or leased office space at Plaza
- Begin future expansion of **Clean Energy Campus Phase I** at north Boone site, expand to a ~60 ZEB base as diesel buses are phasing out

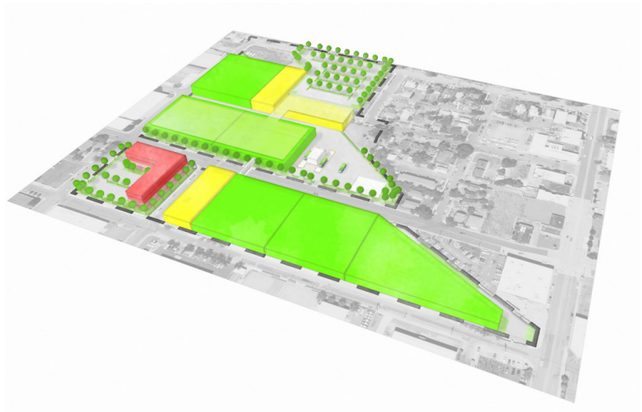


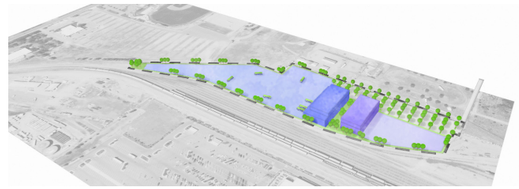

- Clean Energy Campus Phase I at north Boone site operational with ~60 ZEB base and associated **Maintenance**
- Diesel buses nearly completely phased out
- Renovate and expand south Boone site as part of **Clean Energy Campus Phase II**, expanding Boone to a ~120 ZEB base with associated **Maintenance, Administration, Executive and Shared** space
- Move **Administration** and **Executives** to new building on Clean Energy Campus Phase II at Boone site

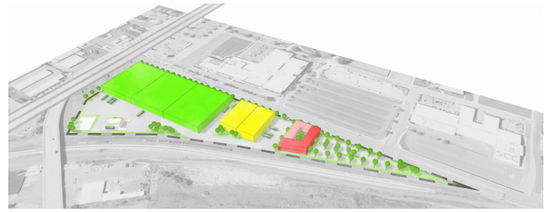
# FUTURE OPERATIONS MODELS ANALYSIS

## 2B - DUAL CAMPUS

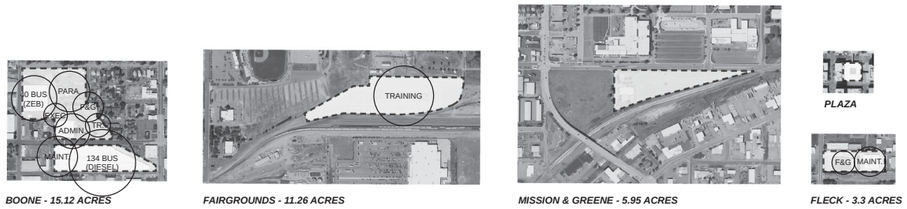


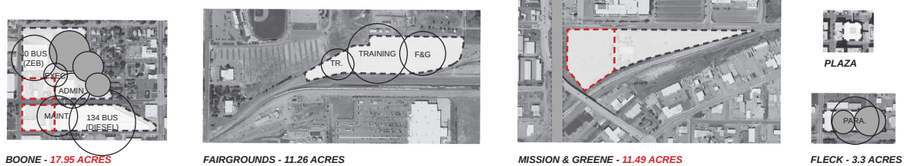




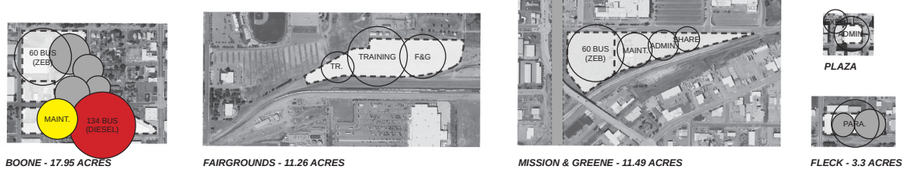
### CURRENT STATE



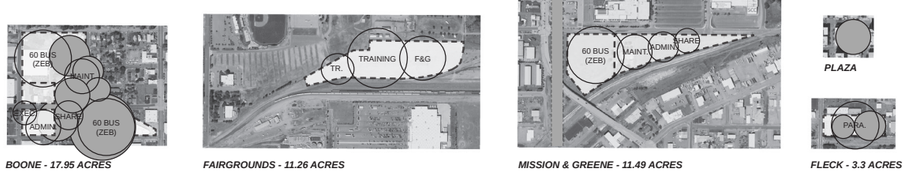

### 5-YEAR PLAN (2030)




### 10-YEAR PLAN (2035)




### 15-YEAR PLAN (2040)




## ASSUMPTIONS:

- Acquisition of 1300 Block (between Adams and Cedar) on north side of Boone
- Acquisition of Spokane County property / 1300 Block on south side of Boone
- Vacation of Adams St. north of Boone, and Sharp Ave. west of Jefferson St.
- Demolition of 1212 Sharp
- Demolition of North Boone (1230 Building) likely, but could be re-purposed
- Additional parking required at Boone likely stacked above bus storage (accessible from north side of site)
- Acquisition of WSDOT property after completion of NSC, and vacation of Thor Ct. at Mission & Greene
- Stacking of program required at Fairgrounds to accommodate Training and F&G
- Existing Fleck program relocated and facilities retrofitted/expanded for Paratransit
- Fairgrounds site improved with new program (Training facilities and F&G)

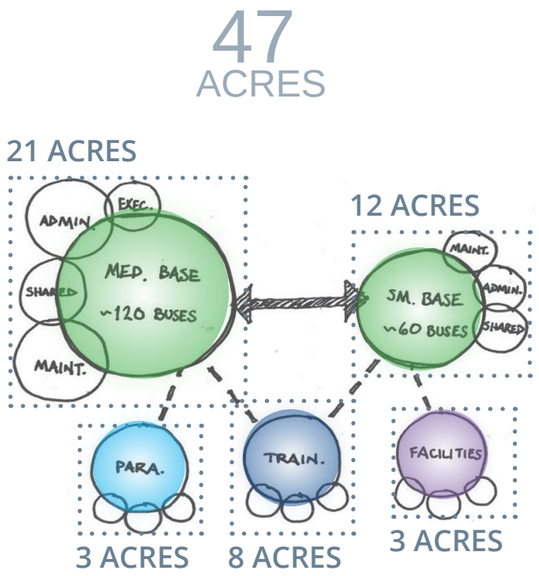
## OPPORTUNITIES:

- ALSC/Coffman: New training facility in ~5 years
- ALSC/Coffman: Potential for no new sites
- ALSC/Coffman: De-couples Paratransit
- **STA: Like the concept of a centralized campus, or Boone as the primary campus**
- **STA: Like the idea of acquiring adjacent properties at Boone**
- **STA: Fairgrounds site could be improved with new facilities**

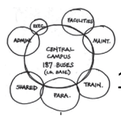
## CHALLENGES:

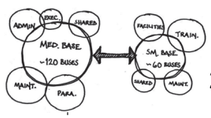
- ALSC/Coffman: Access at Fairgrounds site
- ALSC/Coffman: New storage 10 yrs out b/c of NSC
- ALSC/Coffman: Renovating south Boone to ZEBs
- **STA: Para located at Fleck may be too far east (not central enough)**
- **STA: Operations at N. Boone might be too close to residential and utilize streets not accommodating of buses**
- **STA: Does not maximize the use of the Plaza**
- **STA: Skeptical that Fairgrounds site is worth the investment with new facilities - may be better utilized as a bartering tool with the County for something else**

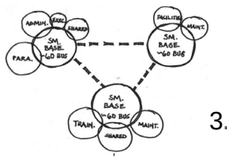
# FUTURE OPERATIONS MODELS ANALYSIS
## 2C - DUAL CAMPUS




## 2C - TRAINING + PARATRANSIT + FACILITIES CAMPUS


1. LARGE BASE / CENTRAL CAMPUS

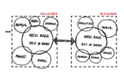

2. DUAL CAMPUS

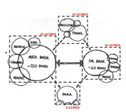

3. NETWORK

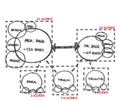

1A. TRAINING CAMPUS


1B. TRAINING + PARATRANSIT CAMPUS


1C. TRAINING + PARA. + FACILITIES CAMPUS


2A. TWO EVENLY SPLIT CAMPUSES

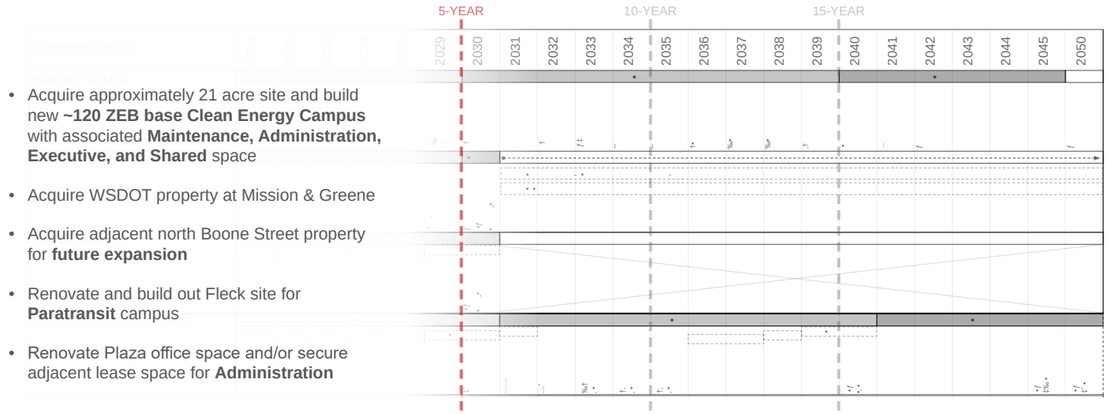

2B. FACILITIES/TRAINING + PARA. CAMPUS


2C. TRAINING + PARA. + FACILITIES CAMPUS

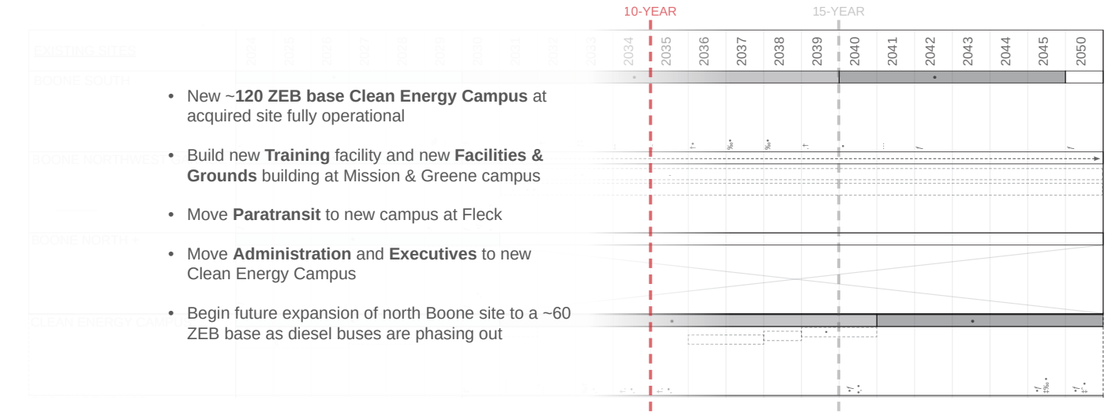

3A. TRAIN./PARA./FACILITIES HUBS


3B. HOME BASE + NETWORK

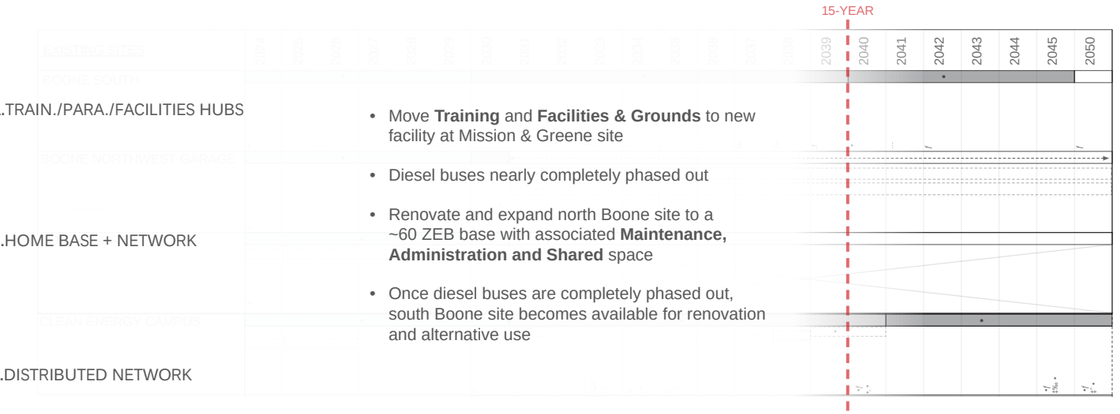

3C. DISTRIBUTED NETWORK




- Acquire approximately 21 acre site and build new **~120 ZEB base Clean Energy Campus** with associated **Maintenance, Administration, Executive, and Shared** space
- Acquire WSDOT property at Mission & Greene
- Acquire adjacent north Boone Street property for **future expansion**
- Renovate and build out Fleck site for **Paratransit** campus
- Renovate Plaza office space and/or secure adjacent lease space for **Administration**



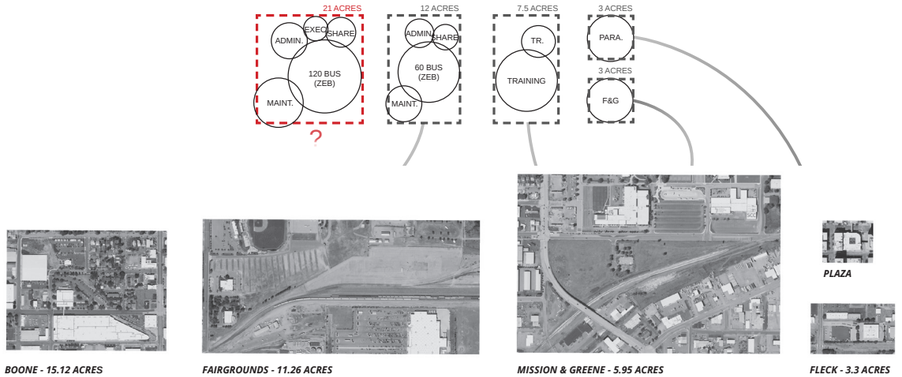

- New ~**120 ZEB base Clean Energy Campus** at acquired site fully operational
- Build new **Training** facility and new **Facilities & Grounds** building at Mission & Greene campus
- Move **Paratransit** to new campus at Fleck
- Move **Administration** and **Executives** to new Clean Energy Campus
- Begin future expansion of north Boone site to a ~60 ZEB base as diesel buses are phasing out

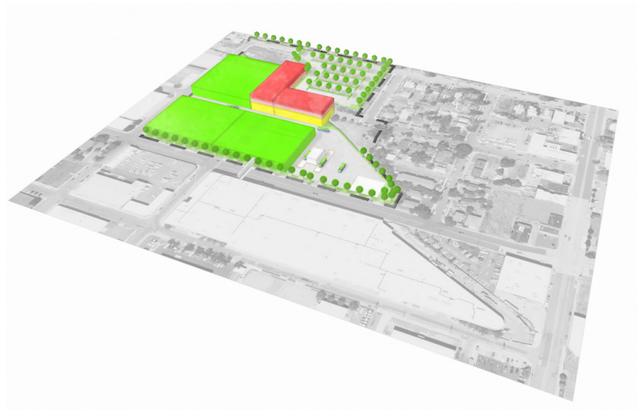


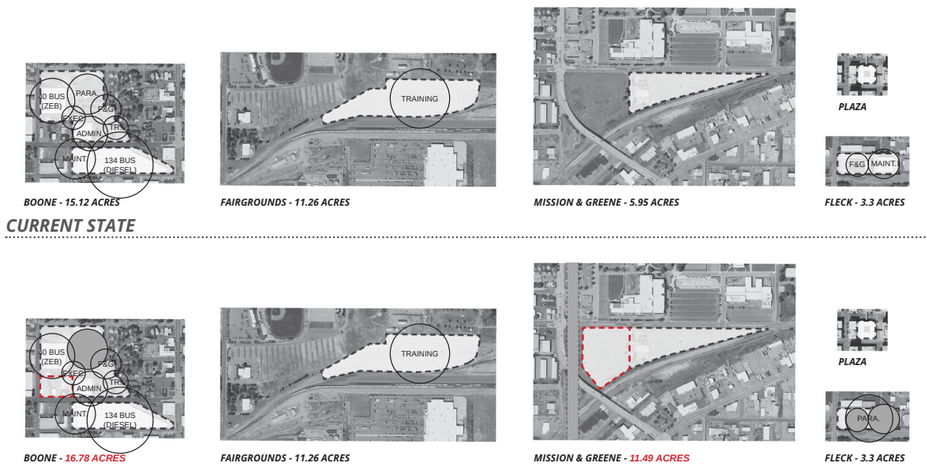

- Move **Training** and **Facilities & Grounds** to new facility at Mission & Greene site
- Diesel buses nearly completely phased out
- Renovate and expand north Boone site to a ~60 ZEB base with associated **Maintenance, Administration and Shared** space
- Once diesel buses are completely phased out, south Boone site becomes available for renovation and alternative use

# FUTURE OPERATIONS MODELS ANALYSIS

## 2C - DUAL CAMPUS






***CURRENT STATE***

***5-YEAR PLAN (2030)***

***10-YEAR PLAN (2035)***

***15-YEAR PLAN (2040)***

## ASSUMPTIONS:

- Acquisition of 1300 Block (between Adams and Cedar) on north side of Boone
- Vacation of Adams St. north of Boone, and Sharp Ave. west of Jefferson St.
- Demolition of 1212 Sharp
- Demolition of North Boone (1230 Building) likely, but could be re-purposed
- Stacking of program (Administration/Shared space over Maintenance) on Boone site
- Acquisition of WSDOT property after completion of NSC, and vacation of Thor Ct. at Mission & Greene
- Stacking of program required at Mission & Greene to accommodate Training and F&G
- Existing Fleck program relocated and facilities retrofitted/expanded for Paratransit
- Fairgrounds site unused/available for land swap or other…
-

## OPPORTUNITIES:

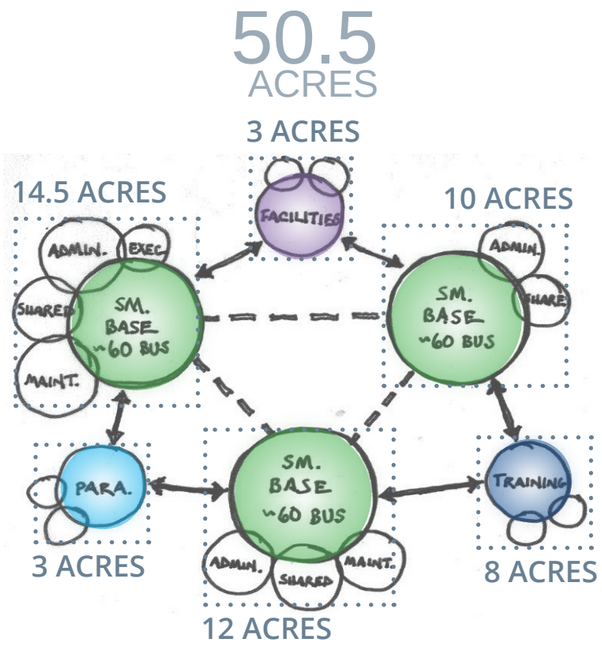
- ALSC/Coffman: New bus storage in ~5 years
- ALSC/Coffman: Re-imagining of South Boone
- ALSC/Coffman: Scalability/phasing of large new site
- ALSC/Coffman: De-couples Paratransit
- STA: **Like the idea of acquiring 1300 Block at Boone, this option gives some flexibility if that's not feasible**
- STA: Fairgrounds site available for land swap / bartering tool with County
- STA: Could Exec move back to Boone, or to the Plaza, in 15 year model, and Para re-purposed to S. Boone?
- STA: Support for separate Training facility coupled with F&G (and possibly Para)
- STA: Pulling operations away from 1212 Sharp is a positive to prevent impacts to neighborhood

## CHALLENGES:

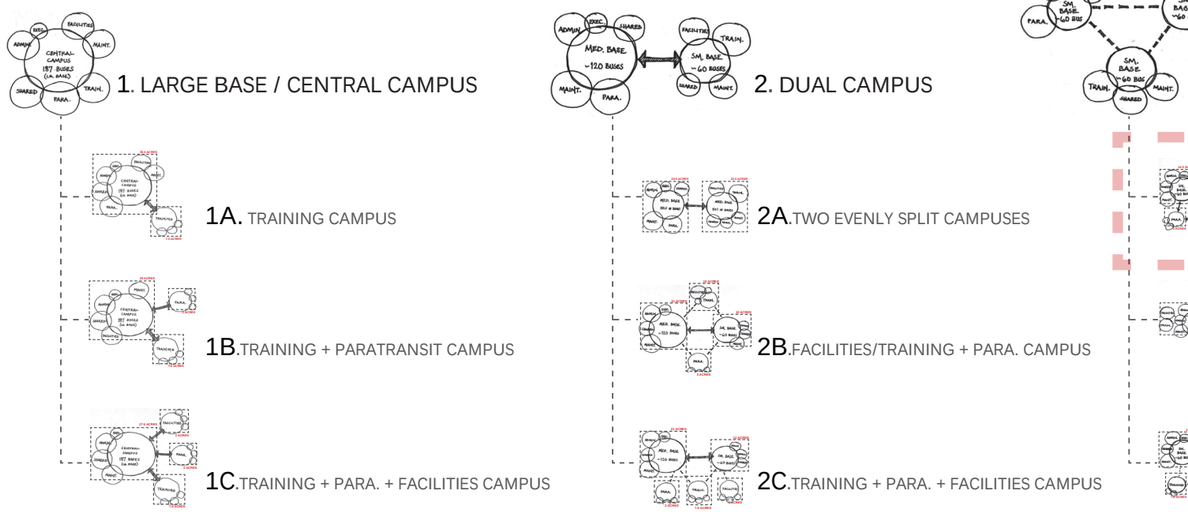
- ALSC/Coffman: Large new site required
- ALSC/Coffman: New training 10 yrs out b/c of NSC (could be solved by phasing)
- STA: Feasibility of large new site location - locating Exec too far away from downtown core is a concern
- STA: South Boone not being utilized for STA program is unfavorable
- STA: Does not maximize the use of the Plaza
- STA: Para located at Fleck may be too far east (not central enough)

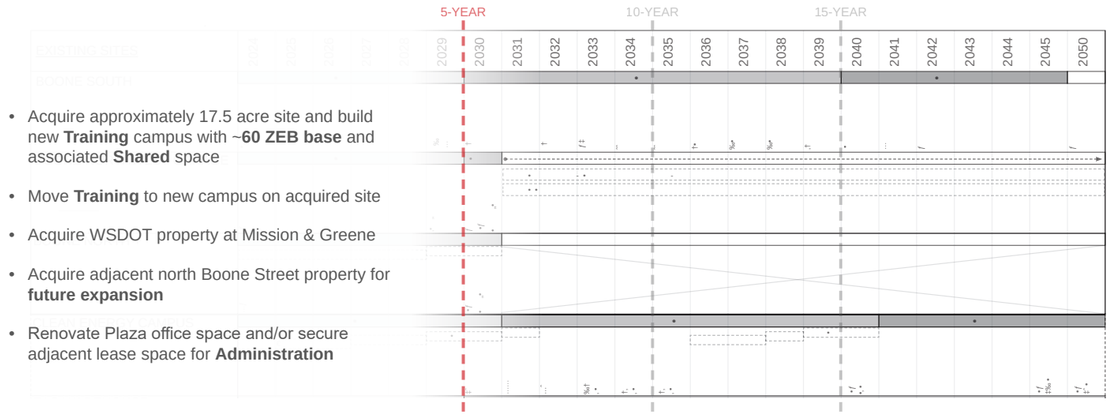
# FUTURE OPERATIONS MODELS ANALYSIS

## 3A - NETWORK

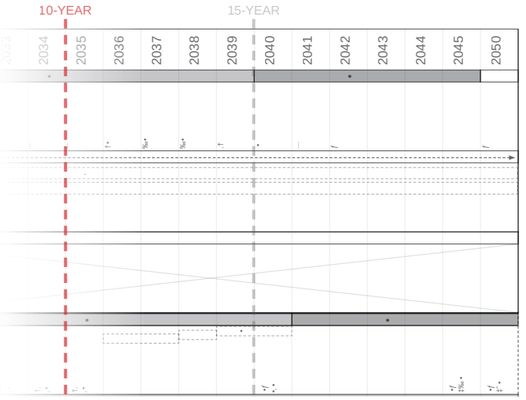



## 3A - TRAINING, PARATRANSIT, FACILITIES HUBS

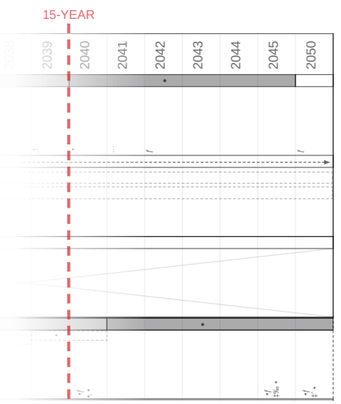



- Acquire approximately 17.5 acre site and build new **Training** campus with ~**60 ZEB base** and associated **Shared** space
- Move **Training** to new campus on acquired site
- Acquire WSDOT property at Mission & Greene
- Acquire adjacent north Boone Street property for **future expansion**
- Renovate Plaza office space and/or secure adjacent lease space for **Administration**



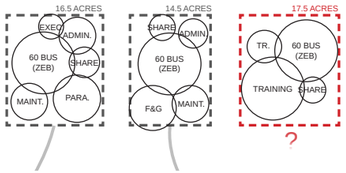

- Build new ~**60 ZEB base Clean Energy Campus** at Mission & Greene with associated **Maintenance, Administration and Shared** space
- Renovate Boone NW Garage for **Paratransit** since it is no longer needed for ZEB storage/charging
- Move **Paratransit** into renovated Boone NW Garage and new facility on acquired north Boone property
- Move **Administration** and **Executives** to renovated and/or leased space at Plaza
- Begin renovation and expansion of north Boone site for **Administration, Executives, Shared** space and **Maintenance**




- Complete renovation and expansion of north Boone site and move **Administration, Executives, Shared** space and **Maintenance** into renovated/ new buildings
- Expand Mission & Greene site by adding new building for **Facilities & Grounds**
- Renovate south Boone to ZEB storage/charging
- Completed Boone campus becomes a **~60 ZEB base Clean Energy Campus** and Paratransit hub

# FUTURE OPERATIONS MODELS ANALYSIS

## 3A - NETWORK



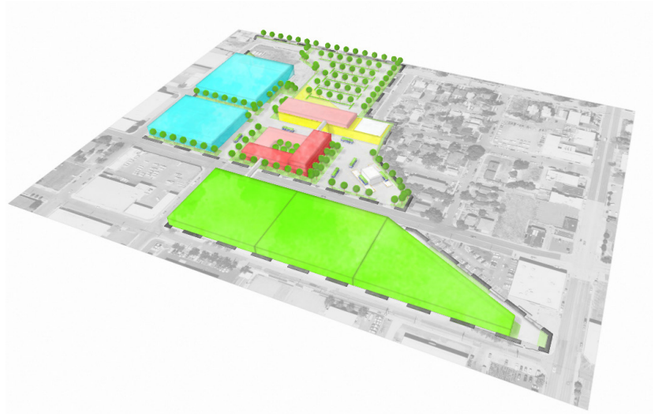

BOONE - 15.12 ACRES

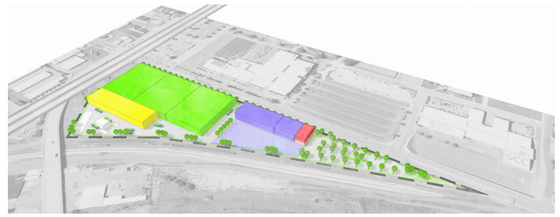
FAIRGROUNDS - 11.26 ACRES

MISSION & GREENE - 5.95 ACRES

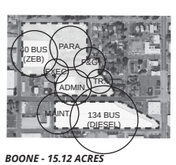
PLAZA

FLECK - 3.3 ACRES





### CURRENT STATE



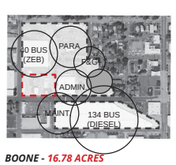

BOONE - 15.12 ACRES


FAIRGROUNDS - 11.26 ACRES

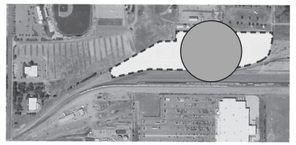
MISSION & GREENE - 5.95 ACRES

PLAZA


FLECK - 3.3 ACRES




BOONE - 16.78 ACRES



FAIRGROUNDS - 11.26 ACRES

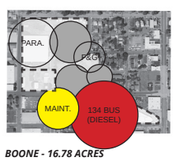
MISSION & GREENE - 11.49 ACRES

PLAZA

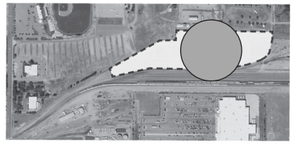

FLECK - 3.3 ACRES


NEW SITE ~17.5 ACRES

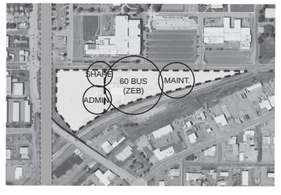
### 5-YEAR PLAN (2030)




BOONE - 16.78 ACRES



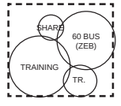
FAIRGROUNDS - 11.26 ACRES




MISSION & GREENE - 11.49 ACRES

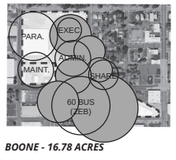
PLAZA


FLECK - 3.3 ACRES

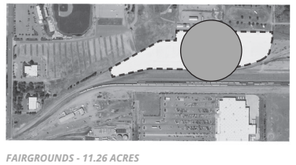



NEW SITE ~17.5 ACRES

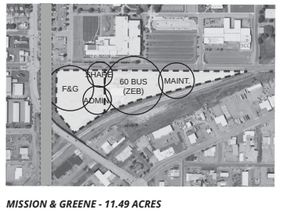
### 10-YEAR PLAN (2035)




BOONE - 16.78 ACRES



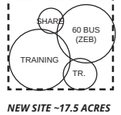
FAIRGROUNDS - 11.26 ACRES




MISSION & GREENE - 11.49 ACRES

PLAZA

FLECK - 3.3 ACRES




NEW SITE ~17.5 ACRES

### 15-YEAR PLAN (2040)



## ASSUMPTIONS:

- Acquisition of 1300 Block (between Adams and Cedar) on north side of Boone
- Vacation of Sharp Ave. west of Jefferson St.
- Demolition of 1212 Sharp
- North Boone (1230 Bldg) shown as being retrofitted & expanded to house Admin., Executives and Shared space
- NW Boone garage retrofitted for Paratransit
- Acquisition of WSDOT property after completion of NSC, and vacation of Thor Ct. at Mission & Greene
- Stacking of F&G program required at Mission & Greene
- Fairgrounds and Fleck sites unused/available for land swap or other...
-
-

## OPPORTUNITIES:

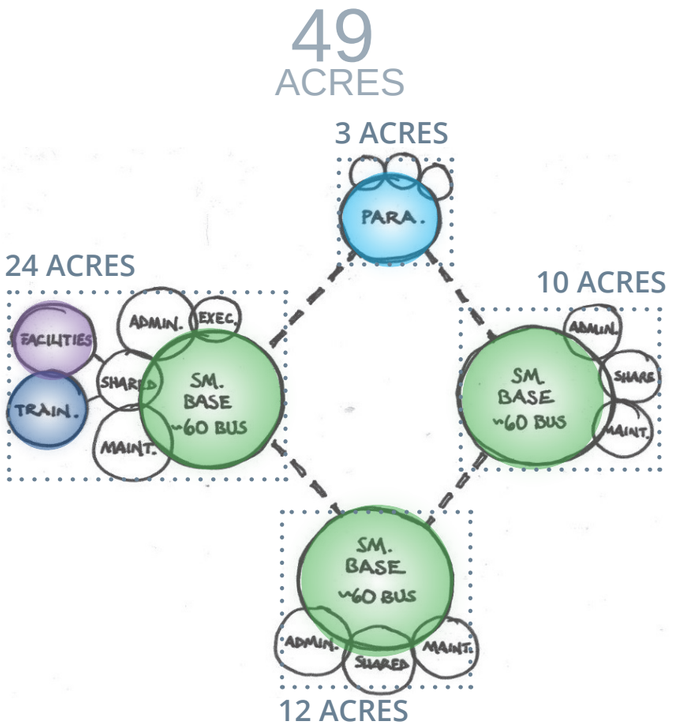
- ALSC/Coffman: New training and storage in ~5 yrs
- ALSC/Coffman: Not dependent on Fleck site
- ALSC/Coffman: Scalability/phasing of large new site
- STA: Like the idea of acquiring 1300 Block at Boone and keeping Boone Campus as primary campus
- STA: Using S. Boone for bus storage (repurposing for ZEBs) is a positive
- STA: Pulling operations away from 1212 Sharp is a positive to prevent impacts to neighborhood
- STA: Support for a separate training facility
- STA: Fairgrounds site available for land swap / bartering tool with County

## CHALLENGES:

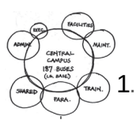
- ALSC/Coffman: Large new site required
- ALSC/Coffman: Renovating south Boone to ZEBs
- ALSC/Coffman: Stacking program likely at M&G site
- STA: Does not maximize the use of the Plaza
- **STA: Mission & Greene site has a lot of program on it - leaves no future flexibility on site**
- **STA: Could NW Boone remain as ZEB and retrofit S. Boone for Para?**
- STA: Could F&G move to Fleck if WSDOT property does not come into play?

# FUTURE OPERATIONS MODELS ANALYSIS

## 3B - NETWORK




## 3B - HOME BASE + NETWORK

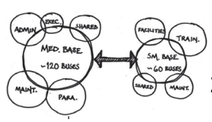



1. LARGE BASE / CENTRAL CAMPUS

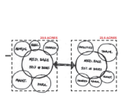
1A. TRAINING CAMPUS

1B.TRAINING + PARATRANSIT CAMPUS

1C.TRAINING + PARA. + FACILITIES CAMPUS




2. DUAL CAMPUS



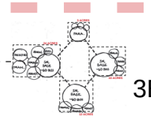
2A.TWO EVENLY SPLIT CAMPUSES

2B.FACILITIES/TRAINING + PARA. CAMPUS

2C.TRAINING + PARA. + FACILITIES CAMPUS

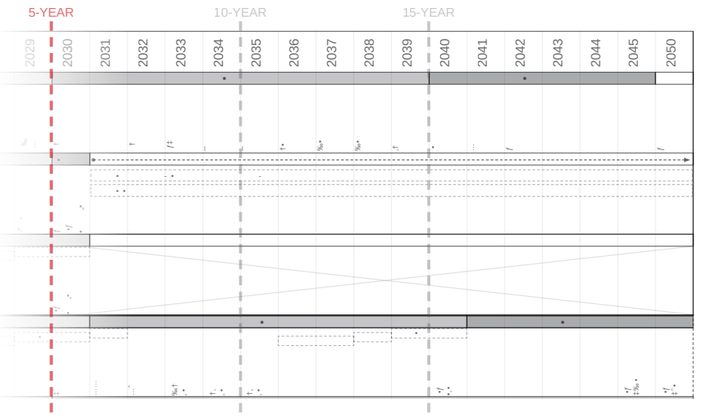

3. NETWORK

3A.TRAIN./PARA./FACILITIES HUBS

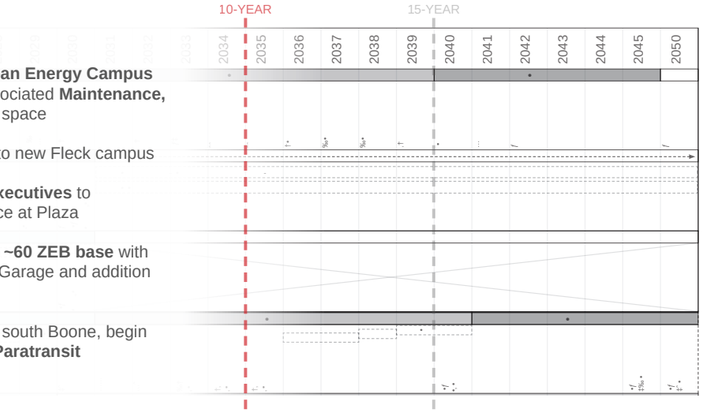


3B.HOME BASE + NETWORK

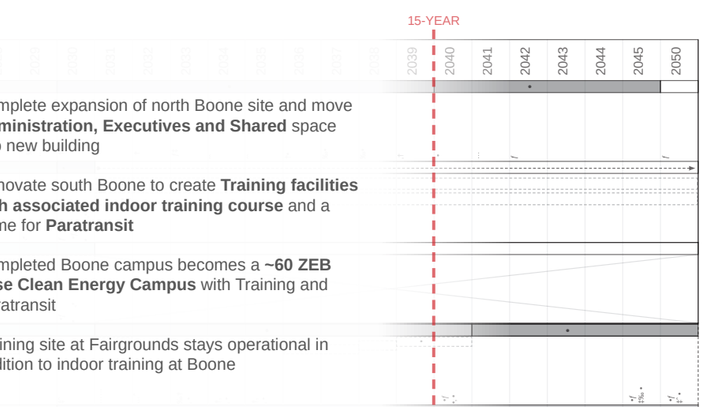
3C.DISTRIBUTED NETWORK




- Acquire approximately 12 acre site and build new **~60 ZEB base** and associated **Maintenance, Administration** and **Shared** space
- Acquire WSDOT property at Mission & Greene
- Renovate and build out Fleck site for **Facilities & Grounds** campus
- Acquire adjacent north Boone Street property for **future expansion**
- Renovate Plaza office space and/or secure adjacent lease space for **Administration**



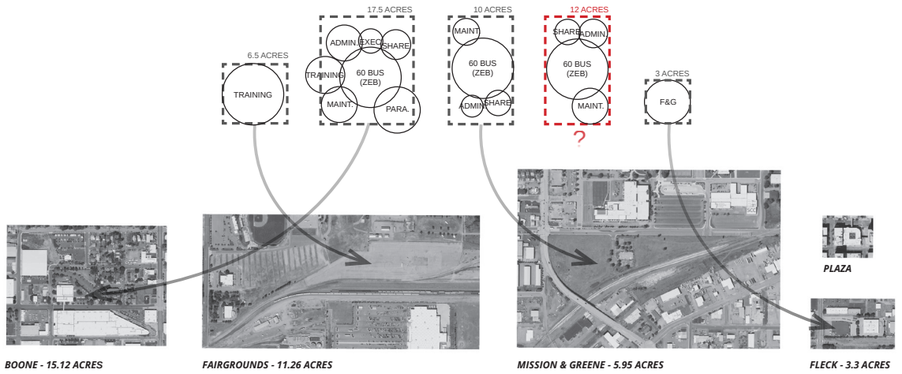

- Build new **~60 ZEB base Clean Energy Campus** at Mission & Greene with associated **Maintenance, Administration and Shared** space
- Move **Facilities & Grounds** to new Fleck campus
- Move **Administration** and **Executives** to renovated and/or leased space at Plaza
- Expand north Boone site to a **~60 ZEB base** with the renovation of NW Boone Garage and addition of new buildings
- As diesel buses phase out of south Boone, begin renovation for **Training** and **Paratransit**

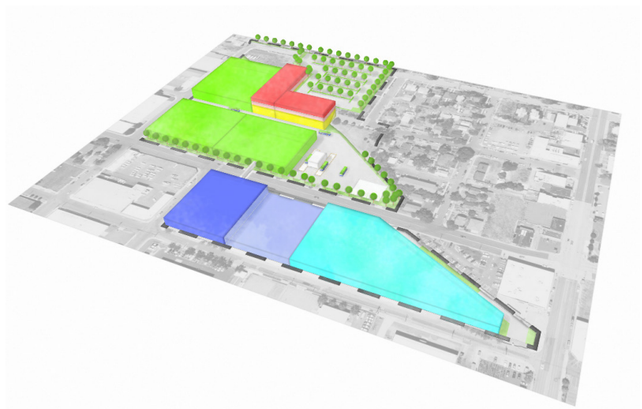


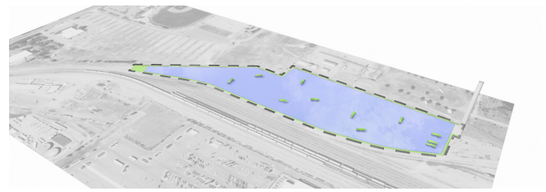

- Complete expansion of north Boone site and move **Administration, Executives and Shared** space into new building
- Renovate south Boone to create **Training facilities with associated indoor training course** and a home for **Paratransit**
- Completed Boone campus becomes a **~60 ZEB base Clean Energy Campus** with Training and Paratransit
- Training site at Fairgrounds stays operational in addition to indoor training at Boone

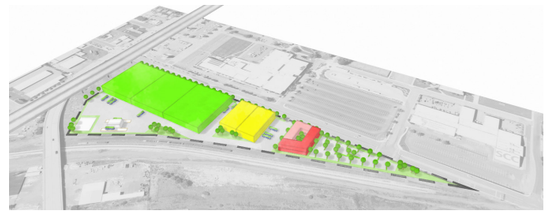
# FUTURE OPERATIONS MODELS ANALYSIS

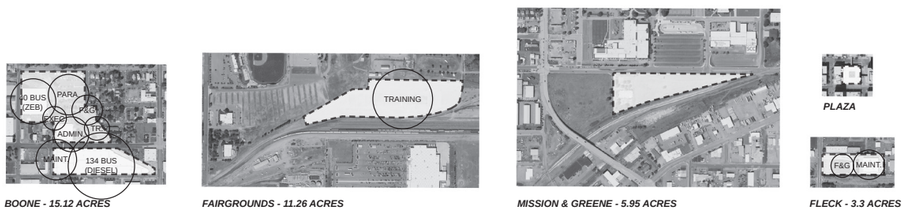
## 3B - NETWORK



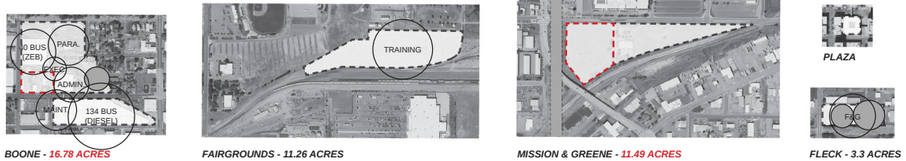





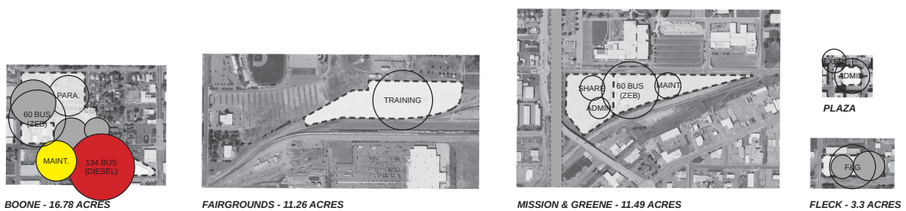




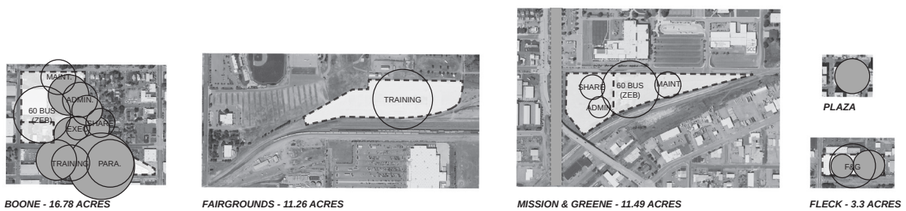

### *CURRENT STATE*




### *5-YEAR PLAN (2030)*




### *10-YEAR PLAN (2035)*




### *15-YEAR PLAN (2040)*

## ASSUMPTIONS:

- Acquisition of 1300 Block (between Adams and Cedar) on north side of Boone
- Vacation of Adams St. north of Boone, and Sharp Ave. west of Jefferson St.
- Demolition of 1212 Sharp
- Demolition of North Boone (1230 Building) likely, but could be re-purposed
- Stacking of program (Administration/Shared space over Maintenance) on Boone site
- Acquisition of WSDOT property after completion of NSC, and vacation of Thor Ct. at Mission & Greene
- Existing Fleck program relocated, and facilities retrofitted/expanded for F&G
- Fairgrounds site used as outdoor training course (use remains unchanged)
-
-

## OPPORTUNITIES:

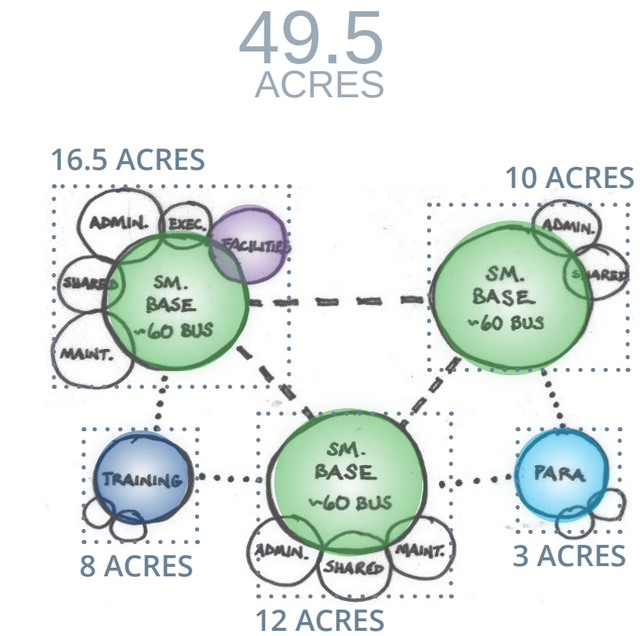
- ALSC/Coffman: **New bus storage in ~5 years**
- ALSC/Coffman: Potential for indoor training course
- **STA: Like the idea of acquiring 1300 Block at Boone and keeping Boone Campus as primary campus**
- **STA: Pulling operations away from 1212 Sharp is a positive to prevent impacts to neighborhood**

## CHALLENGES:

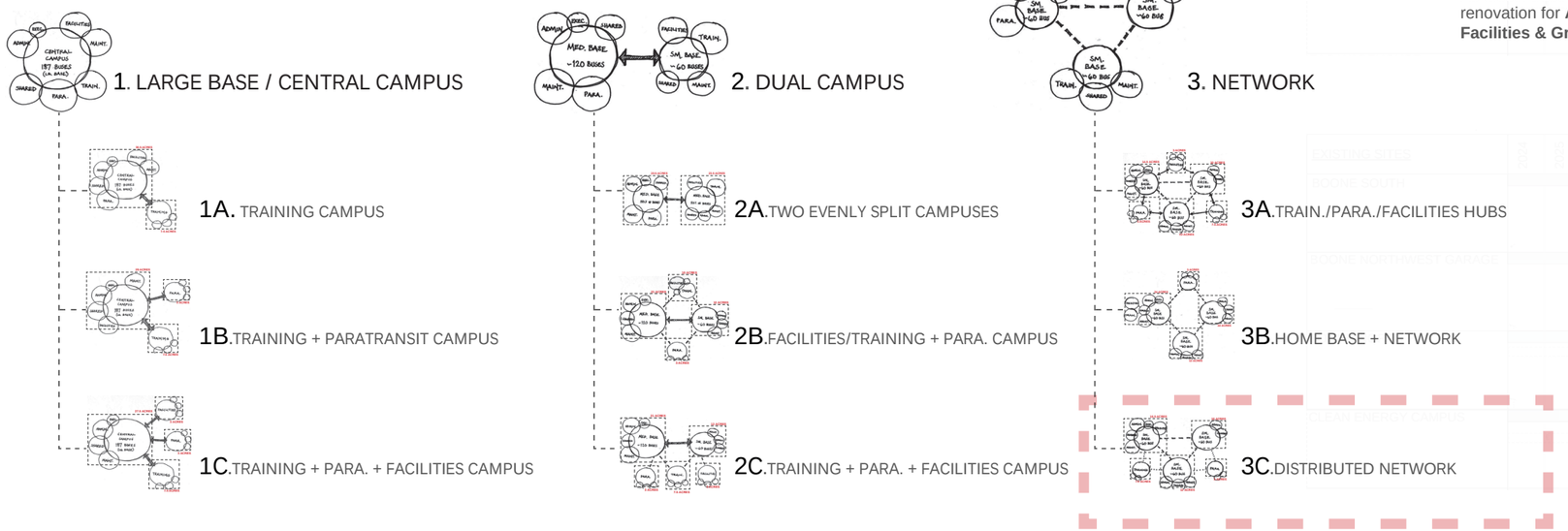
- ALSC/Coffman: New training facilities 10-15 years out
- **STA: Does not maximize the use of the Plaza**
- **STA: Bus storage should remain at S. Boone (re-purposing for ZEB's)**
- **STA: F&G located at Fleck may be too far east (not central enough)**
- **STA: Training got more support as a separate facility, not coupled with the Boone Campus**
- **STA: Zoning at N. Boone won't allow for industrial (Maintenance)**

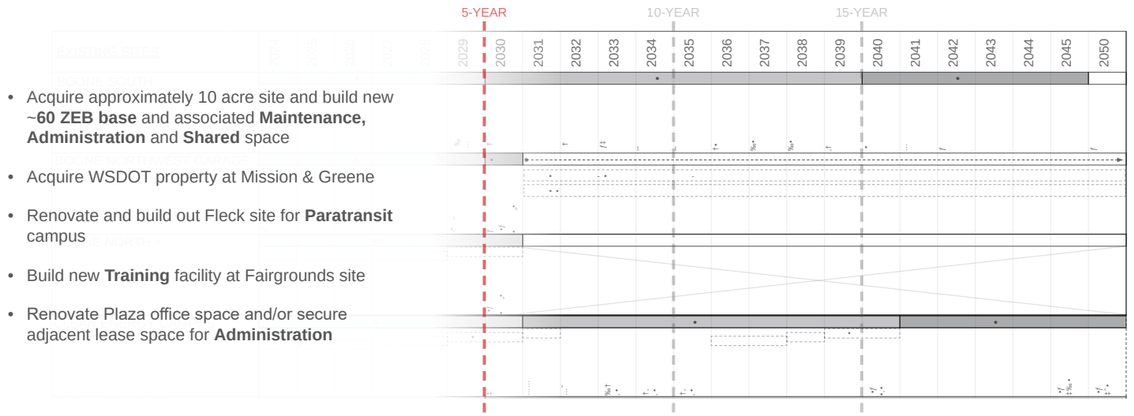
# FUTURE OPERATIONS MODELS ANALYSIS

## 3C - NETWORK

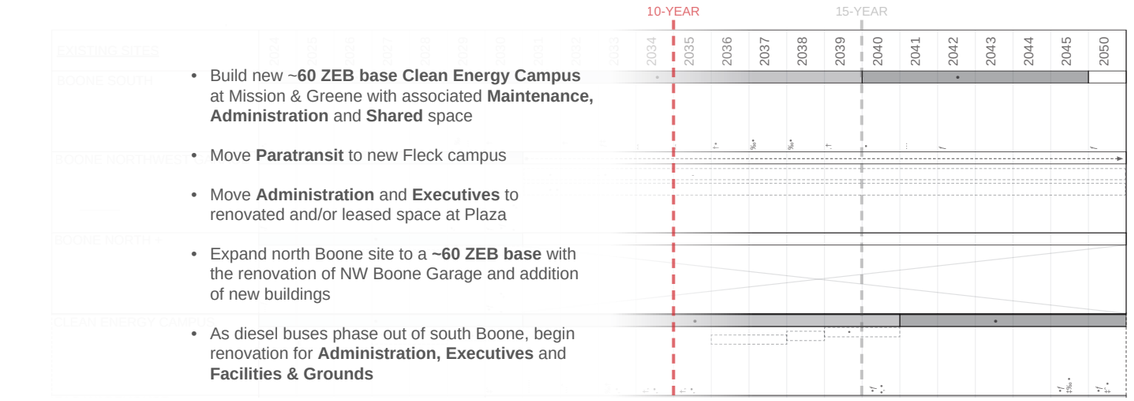



## 3C - DISTRIBUTED NETWORK

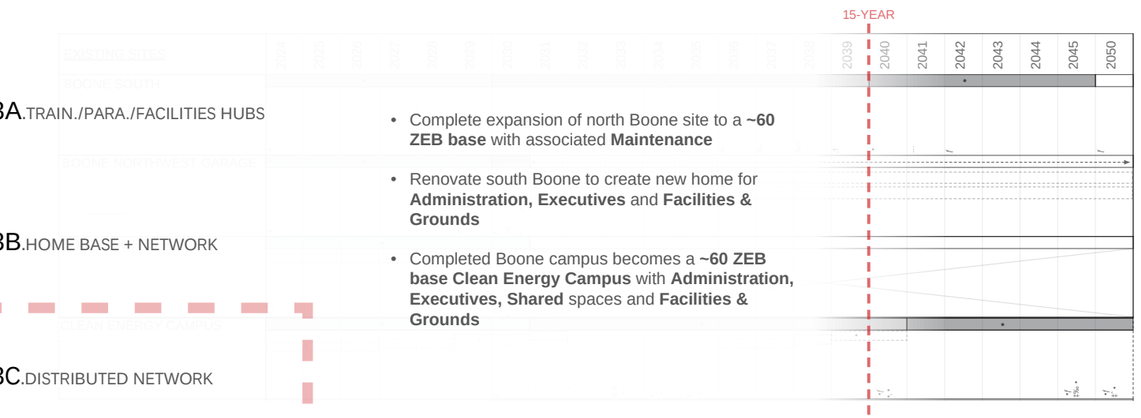



- Acquire approximately 10 acre site and build new **~60 ZEB base** and associated **Maintenance, Administration** and **Shared** space
- Acquire WSDOT property at Mission & Greene
- Renovate and build out Fleck site for **Paratransit** campus
- Build new **Training** facility at Fairgrounds site
- Renovate Plaza office space and/or secure adjacent lease space for **Administration**



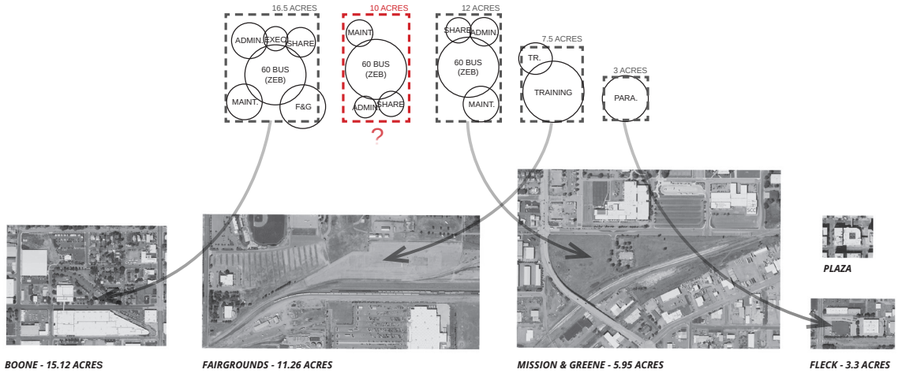

- Build new **~60 ZEB base Clean Energy Campus** at Mission & Greene with associated **Maintenance, Administration** and **Shared** space
- Move **Paratransit** to new Fleck campus
- Move **Administration** and **Executives** to renovated and/or leased space at Plaza
- Expand north Boone site to a **~60 ZEB base** with the renovation of NW Boone Garage and addition of new buildings
- As diesel buses phase out of south Boone, begin renovation for **Administration, Executives** and **Facilities & Grounds**

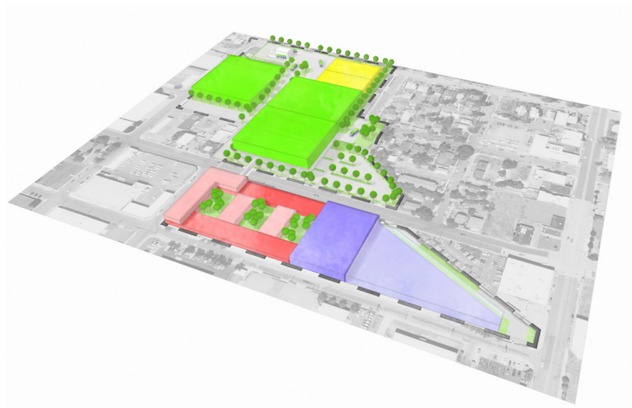


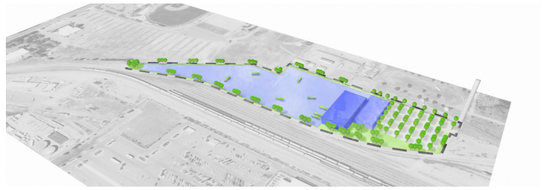

- Complete expansion of north Boone site to a **~60 ZEB base** with associated **Maintenance**
- Renovate south Boone to create new home for **Administration, Executives** and **Facilities & Grounds**
- Completed Boone campus becomes a **~60 ZEB base Clean Energy Campus** with **Administration, Executives, Shared** spaces and **Facilities & Grounds**

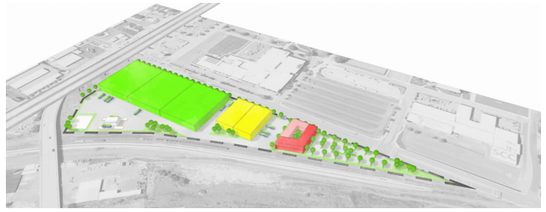
# FUTURE OPERATIONS MODELS ANALYSIS

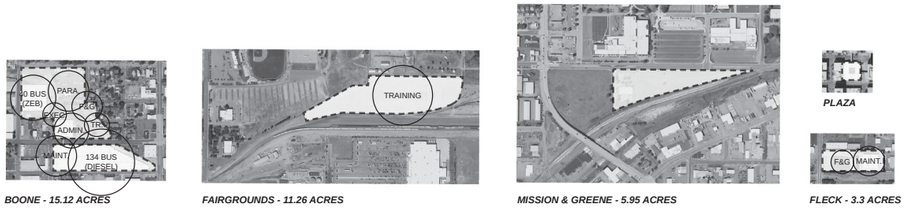
## 3C - NETWORK



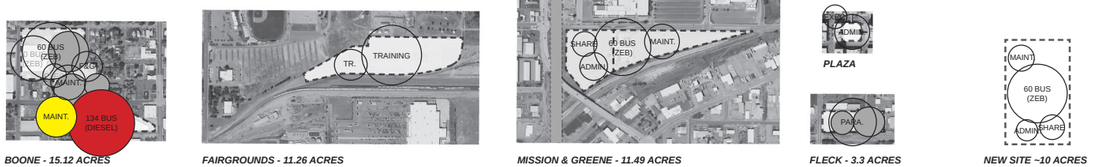







***CURRENT STATE***


***5-YEAR PLAN (2030)***




***10-YEAR PLAN (2035)***


***15-YEAR PLAN (2040)***

### ASSUMPTIONS:

- Vacation of Sharp Ave. west of Jefferson St.
- Demolition of 1212 Sharp
- Demolition of North Boone (1230 Building) likely, but could be re-purposed
- Stacking of program (Bus Storage over Parking) on Boone site
- Acquisition of WSDOT property after completion of NSC, and vacation of Thor Ct. at Mission & Greene
- Existing Fleck program relocated, and facilities retrofitted/expanded for Paratransit
- Fairgrounds site improved with new program (Training facilities)
-
-
-

### OPPORTUNITIES:

- ALSC/Coffman: **New training and storage in ~5 yrs**
- ALSC/Coffman: Site acquisition at Boone not req'd.
- ALSC/Coffman: De-couples Paratransit
- **STA: Like the concept of a centralized campus, or Boone as the primary campus**
- **STA: Fairgrounds site could be improved with new facilities**

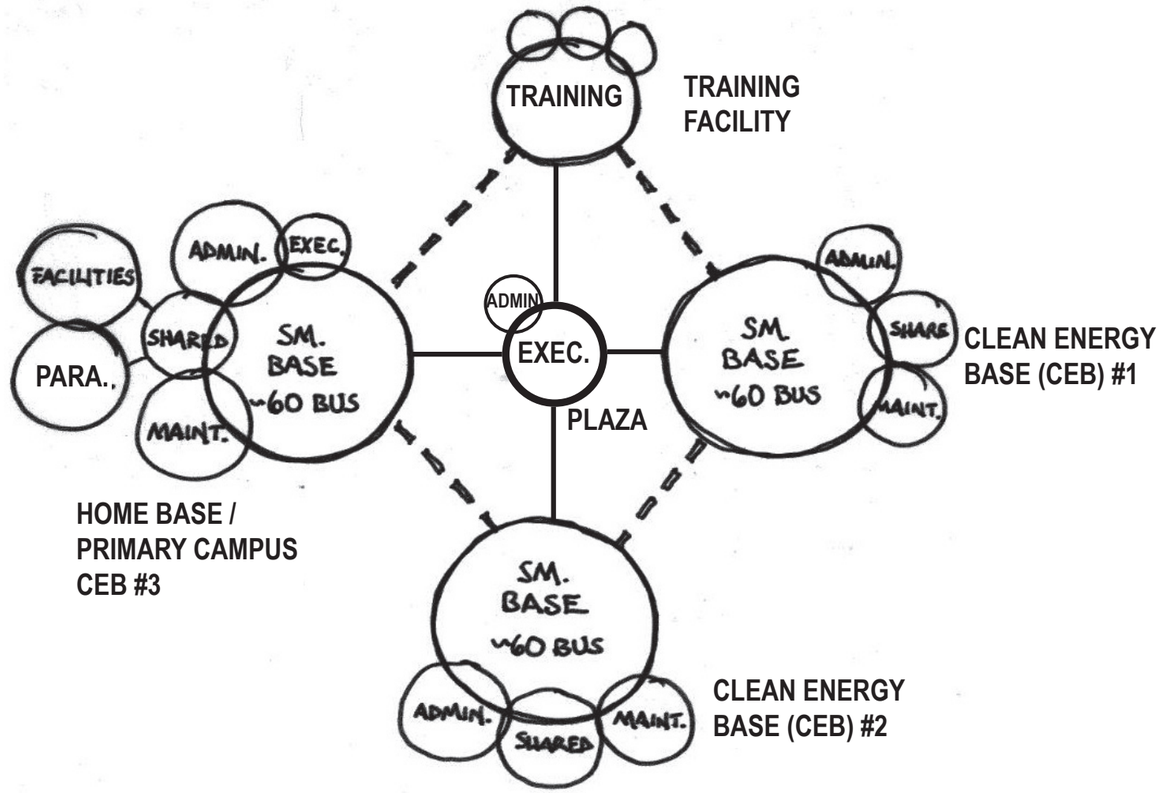
### CHALLENGES:

- ALSC/Coffman: Access at Fairgrounds site
- **STA: Para located at Fleck may be too far east (not central enough)**
- **STA: Operations at N. Boone too close to residential and utilize streets not accommodating of buses**
- **STA: Does not maximize the use of the Plaza**
- **STA: Skeptical that Fairgrounds site is worth the investment with new facilities - may be better utilized as a bartering tool with the County for something else**
- **STA: Zoning at N. Boone won't allow for industrial (Maintenance)**

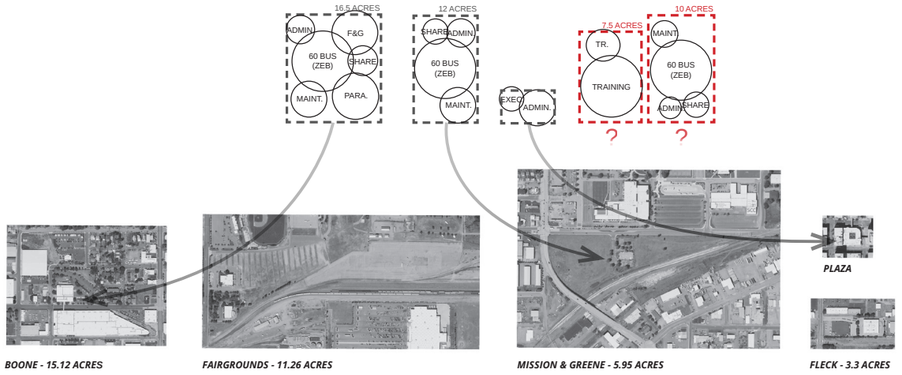
# FUTURE OPERATIONS MODELS ANALYSIS
## PREFERRED ALTERNATIVE - MODIFIED NETWORK

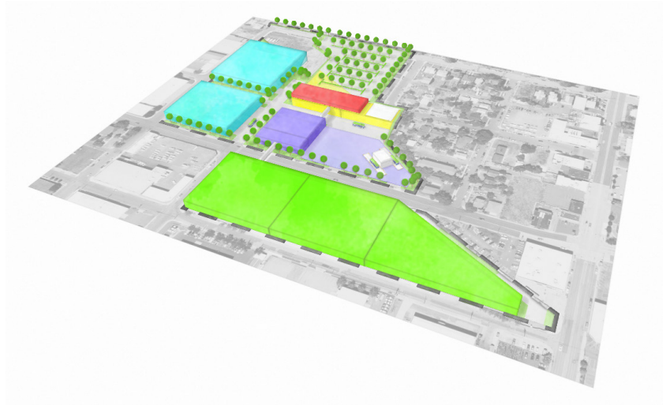
### What we heard...

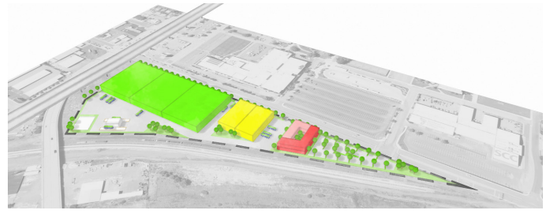
- Dual Campus or Network models are preferred
- Immediate Needs = ZEB Bus Storage/Charging and Training Facilities
- Future flexibility is always a priority
- Utilize and activate the Plaza with STA Program
- Boone Campus wants to remain as the primary campus
- Like the idea of expanding Boone Campus into adjacent 1300 block parcels
- Use S. Boone for STA function/program, Using S. Boone for bus storage (repurposing for ZEBs) is a positive
- There is support for a separate Training facility
- Pulling operations away from 1212 Sharp is a positive to prevent impacts to neighborhood
- Zoning at 1212 Sharp could prevent any industrial use
- Fairgrounds site might be better utilized as a land swap or bartering tool with County
- Executive Wing wants to be centrally located
- Paratransit and Facilities and Grounds also want to be centrally located
- Idea of one central campus at Boone is intriguing, but amount of demolition and construction required seems unrealistic
- There is potential for property acquisition south of Mission & Greene site

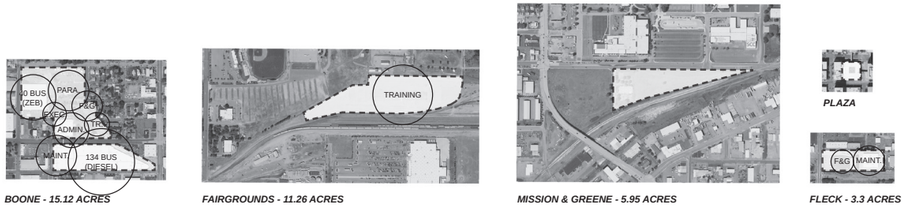


# FUTURE OPERATIONS MODELS ANALYSIS
## PREFERRED ALTERNATIVE - MODIFIED NETWORK



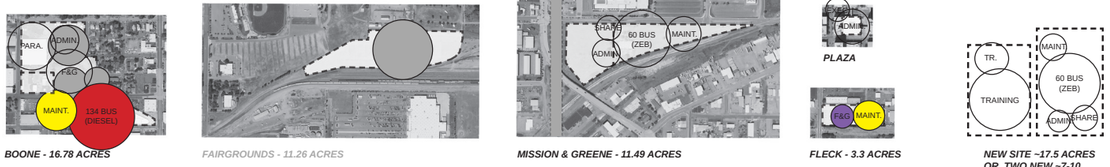








### *CURRENT STATE*


### *5-YEAR PLAN (2030)*




### *10-YEAR PLAN (2035)*


### *15-YEAR PLAN (2040)*

## ASSUMPTIONS:

- Acquisition of 1300 Block (between Adams and Cedar) on north side of Boone
- Vacation of Sharp Ave. west of Jefferson St.
- Demolition of 1212 Sharp
- North Boone (1230 Bldg) shown as being retrofitted (& possibly expanded) to house F&G
- NW Boone garage retrofitted for Paratransit
- Acquisition of WSDOT property after completion of NSC, and vacation of Thor Ct. at Mission & Greene
- Fairgrounds and Fleck sites unused/available for land swap or other…
-
-
-

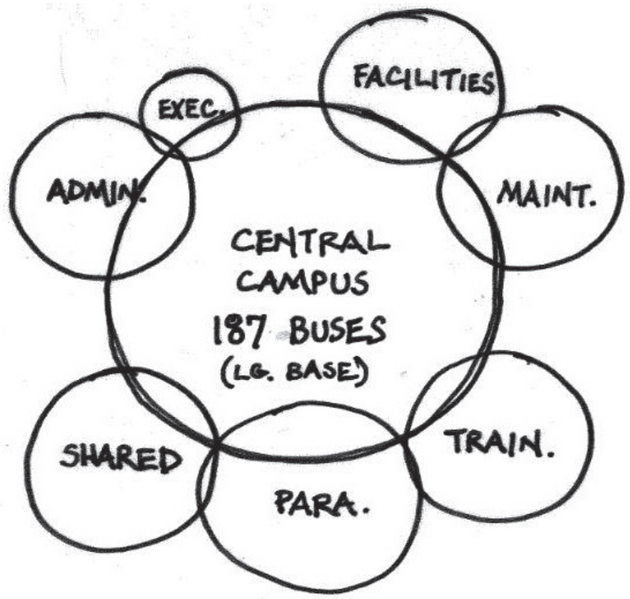
## OPPORTUNITIES:

- ALSC/Coffman: **New training and storage in ~5 yrs**
- ALSC/Coffman: Not dependent on Fleck site
- ALSC/Coffman: Scalability/phasing of large new site, future expansion into training course a possibility
- **STA: Like the idea of acquiring 1300 Block at Boone and keeping Boone Campus as primary campus**
- **STA: Using S. Boone for bus storage (repurposing for ZEB's) is a positive**
- **STA: Pulling operations away from 1212 Sharp is a positive to prevent impacts to neighborhood**
- **STA: Support for a separate training facility**
- **STA: Fairgrounds site available for land swap / bartering tool with County**
- **STA: Utilizes the Plaza for Admin and Executives, and keeps F&G and Para central**

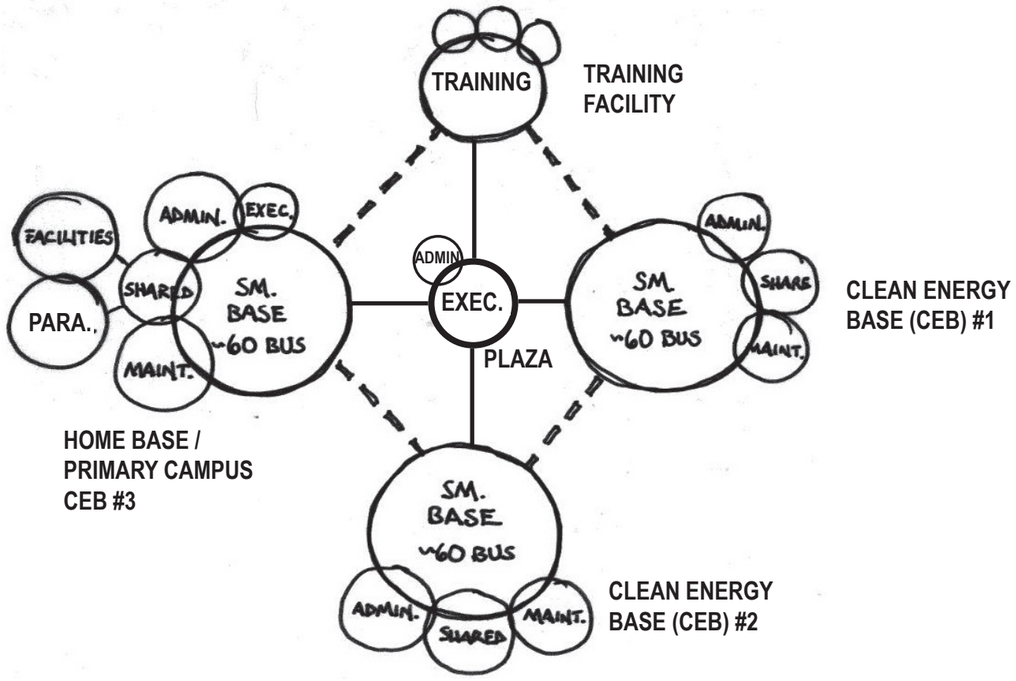
## CHALLENGES:

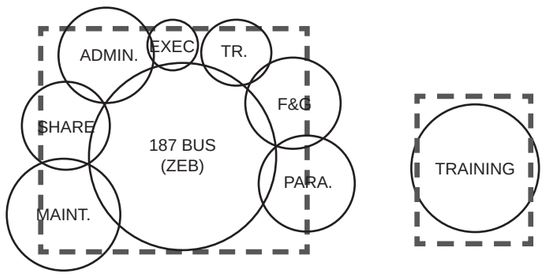
- ALSC/Coffman: Large new site required, or could be acquisition of two smaller sites - one for Training and one for 60 bus clean energy campus
- ALSC/Coffman: Renovating south Boone to ZEBs
- **STA: Could NW Boone remain as ZEB and retrofit S. Boone for Para?**

## Current

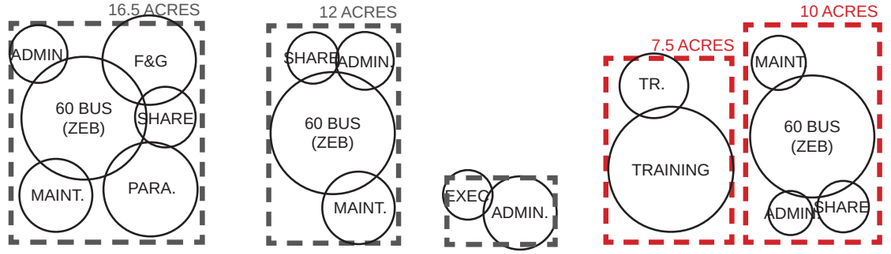



## Future



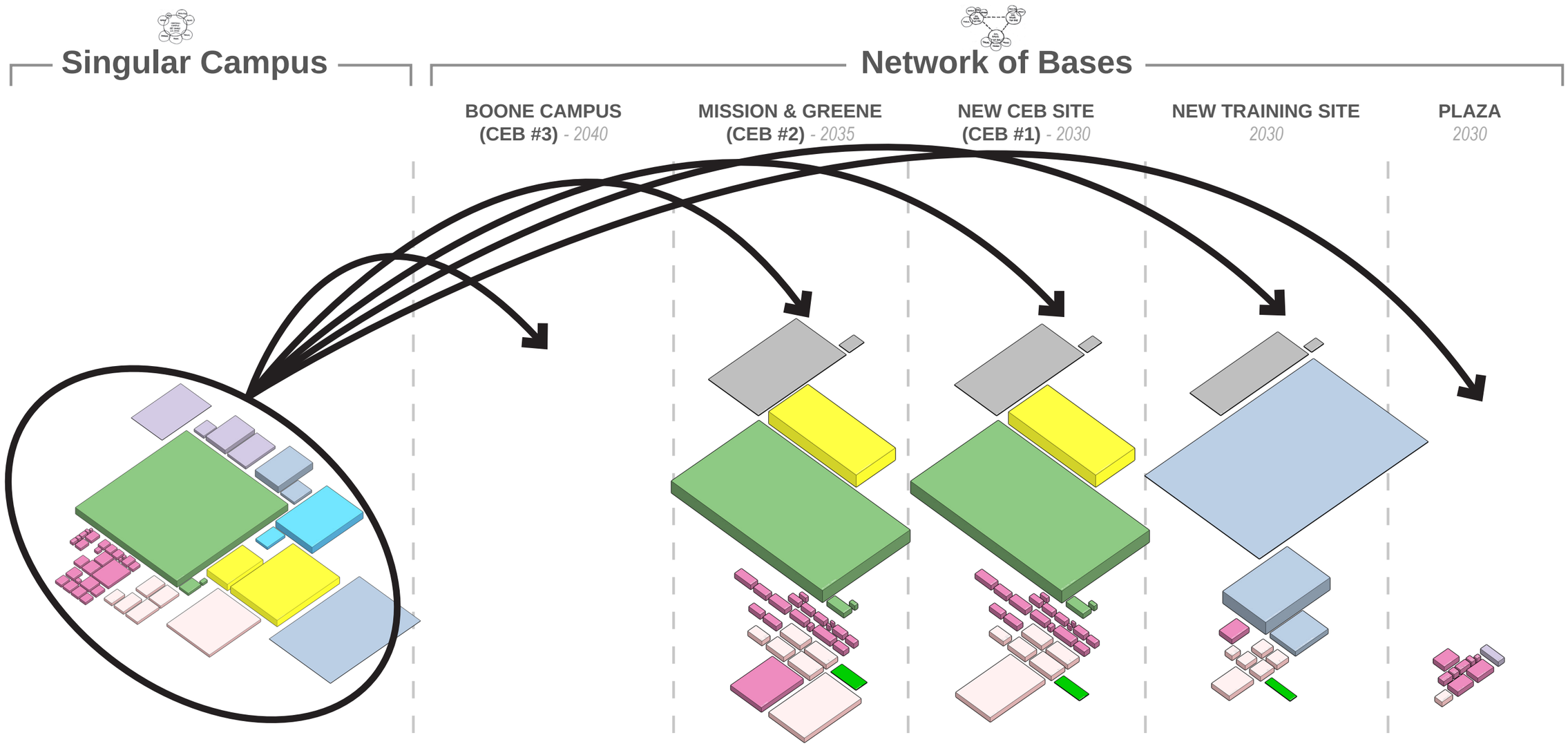




Singular Campus



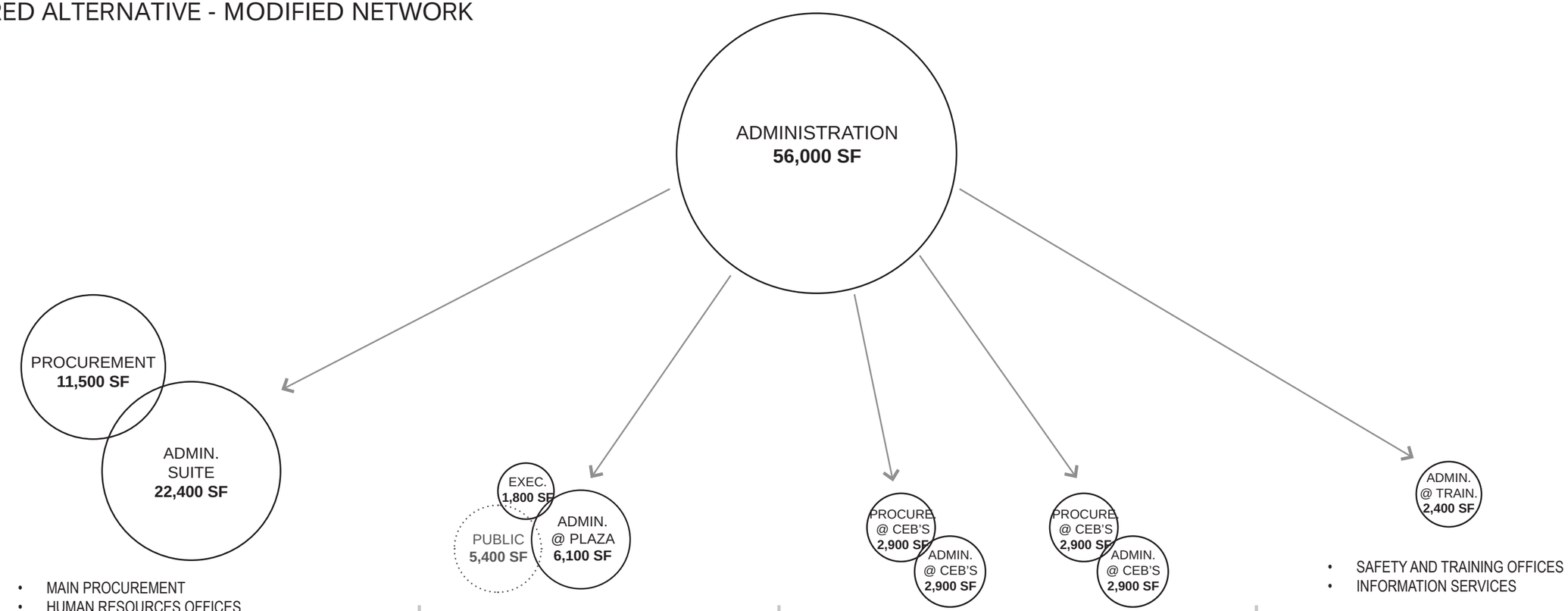

Network of Bases

# FUTURE OPERATIONS MODELS ANALYSIS
## PREFERRED ALTERNATIVE - MODIFIED NETWORK




| PROGRAM SUMMARY | | NETWORK LOCATION | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| DESCRIPTION | 2050 | BOONE (CEB #3) | | | MISSION & GREENE (CEB #2) | | | NEW CEB SITE (CEB #1) | | | NEW TRAINING SITE | | | PLAZA | | |
| | TOTAL SF | % of SF | TOTAL SF | YEAR | % of SF | TOTAL SF | YEAR | % of SF | TOTAL SF | YEAR | % of SF | TOTAL SF | YEAR | % of SF | TOTAL SF | YEAR |
| **OVERALL BUILDING TOTALS** | | **427,594 SF** | | | **227,159 SF** | | | **227,159 SF** | | | **51,311 SF** | | | **16,807 SF** | | |
| EXTERIOR SPACE TOTALS | | | 180,758 SF | | | 41,967 SF | | | 41,967 SF | | | 232,392 SF | | | 0 SF | |

# FUTURE OPERATIONS MODELS ANALYSIS
## PREFERRED ALTERNATIVE - MODIFIED NETWORK




- MAIN PROCUREMENT
- HUMAN RESOURCES OFFICES
- SAFETY / CLAIMS
- COMMUNICATIONS & MARKETING OFFICES
- BUSINESS TO BUSINESS
- WEB
- PAYROLL & AUDITING OFFICES
- INFORMATION SERVICES
- RECORDS
- PLANNING & DEVELOPMENT OFFICES
- INFRASTRUCTURE DEV., SERVICE DEV., CAPITAL DEV.
- FACILITIES MASTER PLANNING
- BRT DEV. AND IMPLEMENTATION
- PLANNING & GRANTS
- COMMUNITY DEVELOPMENT
- HOTELING OFFICE SPACE FOR CEO

**PRIMARY CEB CAMPUS**
33,900 SF

- CUSTOMER SERVICE
- SECURITY
- EXECUTIVE WING
  - *CEO Office*
  - *Clerk of the Authority Office*
  - *Executive Assistant Office*
  - *Lawyer and Hoteling Office*
  - *Library (Secure)*
  - *Copy/Supply Room*
  - *Restroom*
  - *Storage*

**PLAZA**
7,900 SF

- SATELLITE PROCUREMENT
- HOTELING SPACE FOR ALL DEPARTMENTS
- SMALL OFFICE SPACE ALLOCATED FOR:
  - *HR, Safety & Security*
  - *Communications, Marketing & Web*
  - *Payroll, Auditing & Records*
  - *Information Services*
  - *ID, SD & CD*
  - *Planning, Grants & Community Dev.*

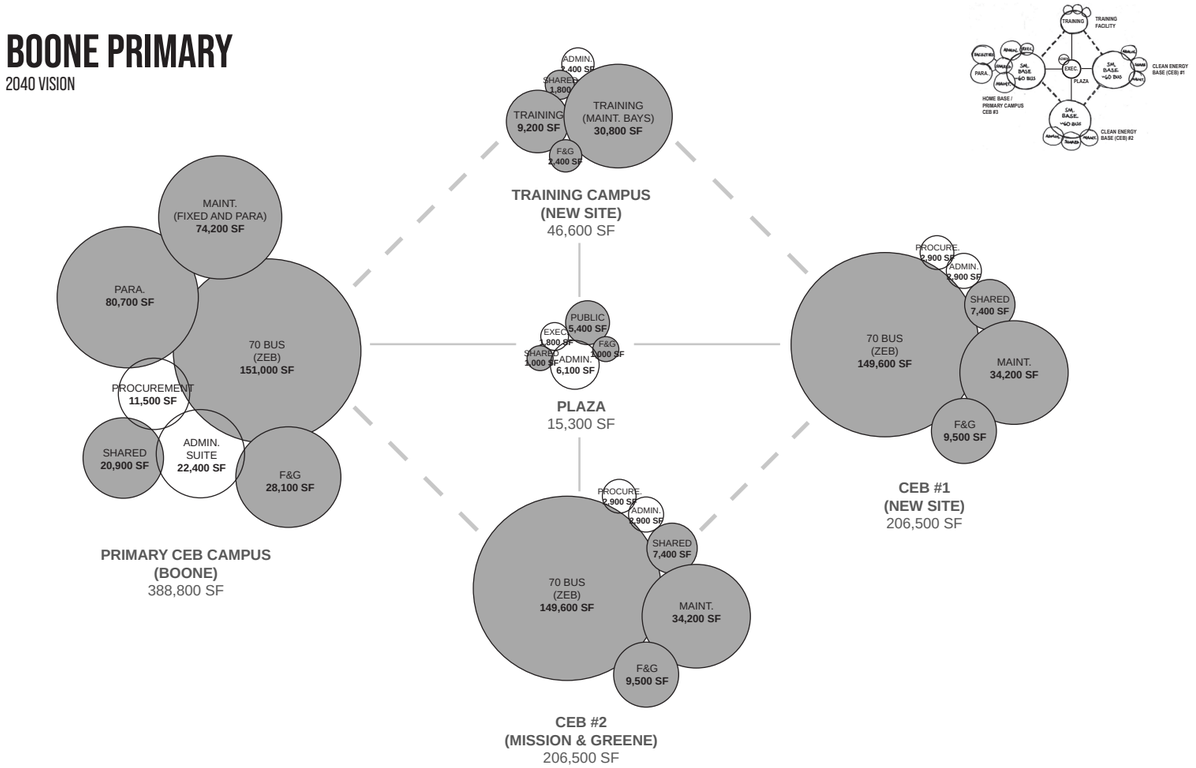
**NETWORK CEB'S**
5,800 SF EA.

- SAFETY AND TRAINING OFFICES
- INFORMATION SERVICES

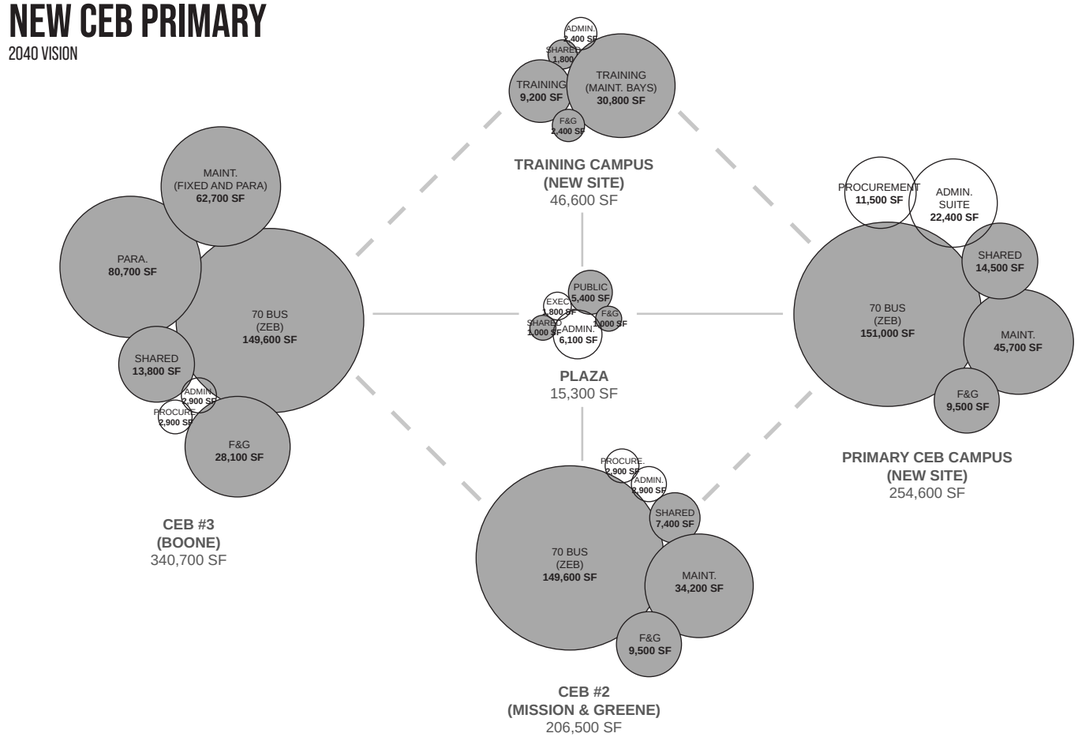
**TRAINING CAMPUS**
2,400 SF

# FUTURE OPERATIONS MODELS ANALYSIS
## PREFERRED ALTERNATIVE - MODIFIED NETWORK

## BOONE PRIMARY
2040 VISION

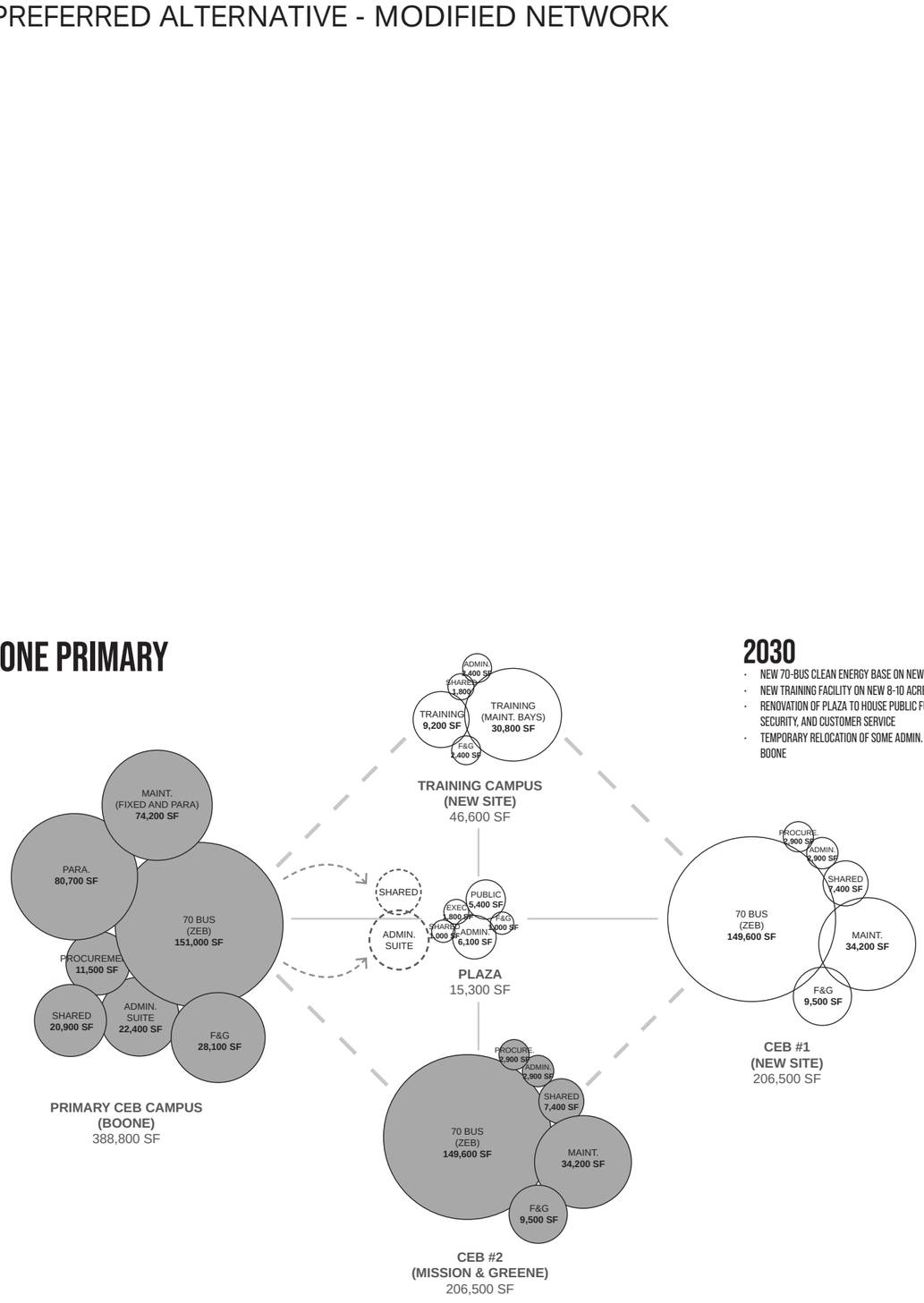



## NEW CEB PRIMARY
2040 VISION



# FUTURE OPERATIONS MODELS ANALYSIS
## PREFERRED ALTERNATIVE - MODIFIED NETWORK

# BOONE PRIMARY
2030



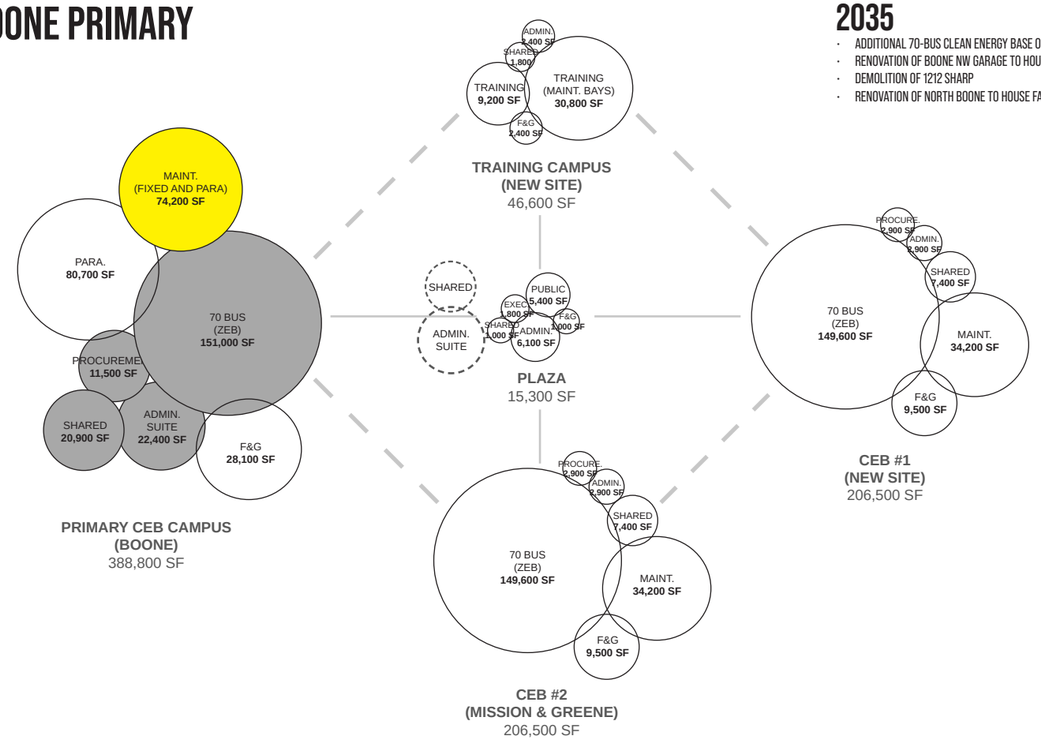

## 2030

- NEW 70-BUS CLEAN ENERGY BASE ON NEW 10-12 ACRE SITE
- NEW TRAINING FACILITY ON NEW 8-10 ACRE SITE
- RENOVATION OF PLAZA TO HOUSE PUBLIC FUNCTIONS, EXECUTIVES, SECURITY, AND CUSTOMER SERVICE
- TEMPORARY RELOCATION OF SOME ADMIN. FUNCTIONS TO ALLEVIATE BOONE





# BOONE PRIMARY
2035

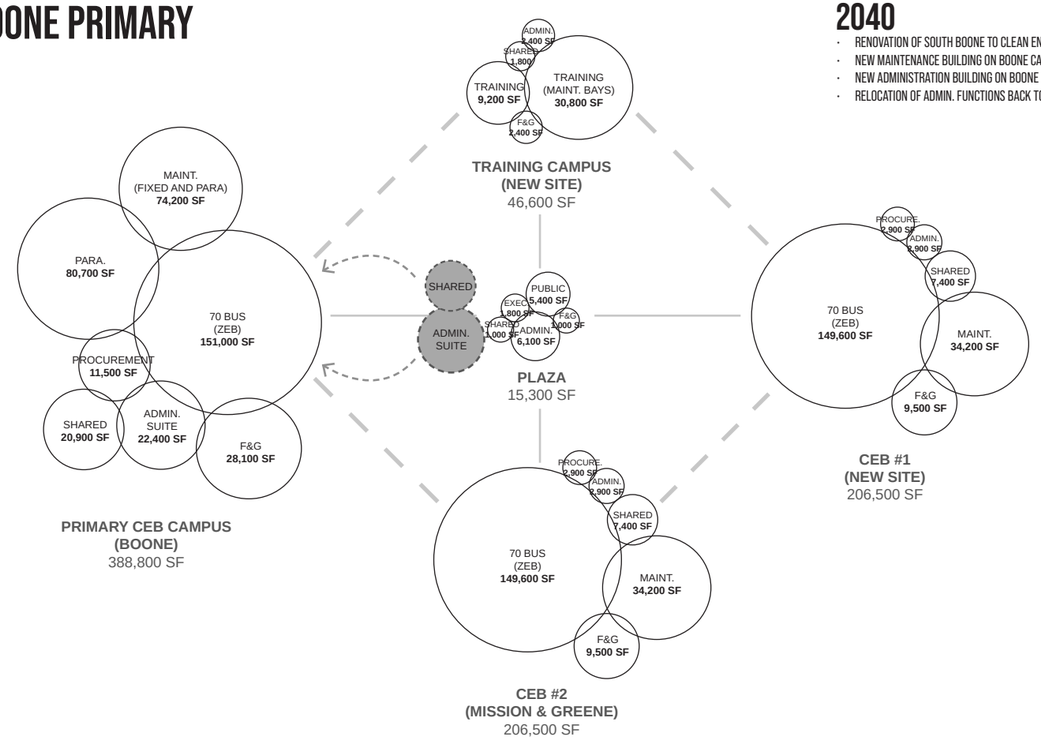



## 2035

- ADDITIONAL 70-BUS CLEAN ENERGY BASE ON 10-12 ACRE SITE
- RENOVATION OF BOONE NW GARAGE TO HOUSE PARATRANSIT
- DEMOLITION OF 1212 SHARP
- RENOVATION OF NORTH BOONE TO HOUSE FACILITIES AND GROUNDS



# BOONE PRIMARY
2040

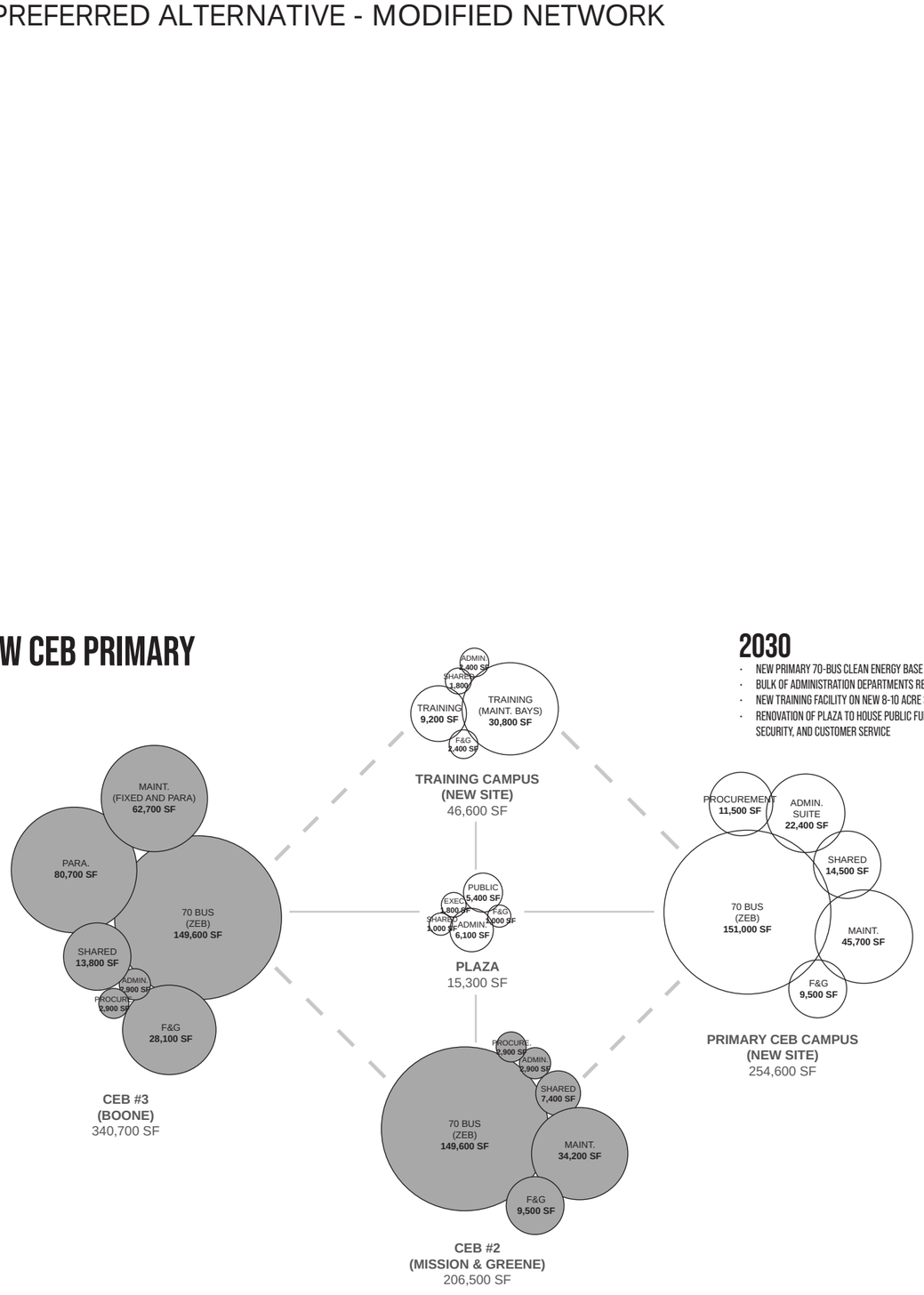



## 2040

- RENOVATION OF SOUTH BOONE TO CLEAN ENERGY (70 ZEB'S)
- NEW MAINTENANCE BUILDING ON BOONE CAMPUS
- NEW ADMINISTRATION BUILDING ON BOONE CAMPUS
- RELOCATION OF ADMIN. FUNCTIONS BACK TO BOONE

# FUTURE OPERATIONS MODELS ANALYSIS
## PREFERRED ALTERNATIVE - MODIFIED NETWORK

## NEW CEB PRIMARY
2030



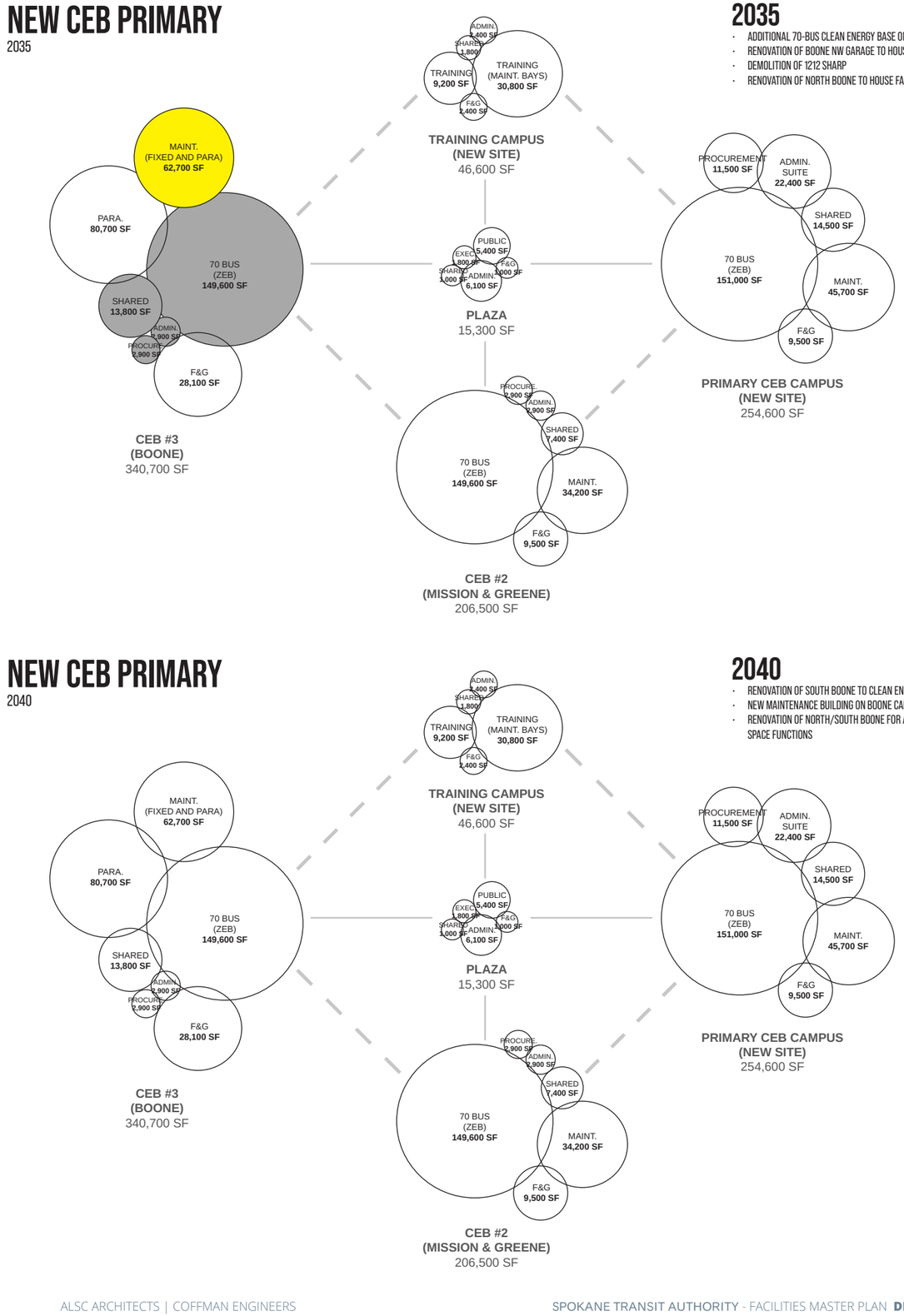

## 2030

- NEW PRIMARY 70-BUS CLEAN ENERGY BASE ON NEW 12 ACRE SITE
- BULK OF ADMINISTRATION DEPARTMENTS RELOCATED TO CEB #1
- NEW TRAINING FACILITY ON NEW 8-10 ACRE SITE
- RENOVATION OF PLAZA TO HOUSE PUBLIC FUNCTIONS, EXECUTIVES, SECURITY, AND CUSTOMER SERVICE





## NEW CEB PRIMARY
2035




## 2035

- ADDITIONAL 70-BUS CLEAN ENERGY BASE ON 10-12 ACRE SITE
- RENOVATION OF BOONE NW GARAGE TO HOUSE PARATRANSIT
- DEMOLITION OF 1212 SHARP
- RENOVATION OF NORTH BOONE TO HOUSE FACILITIES AND GROUNDS



## NEW CEB PRIMARY
2040

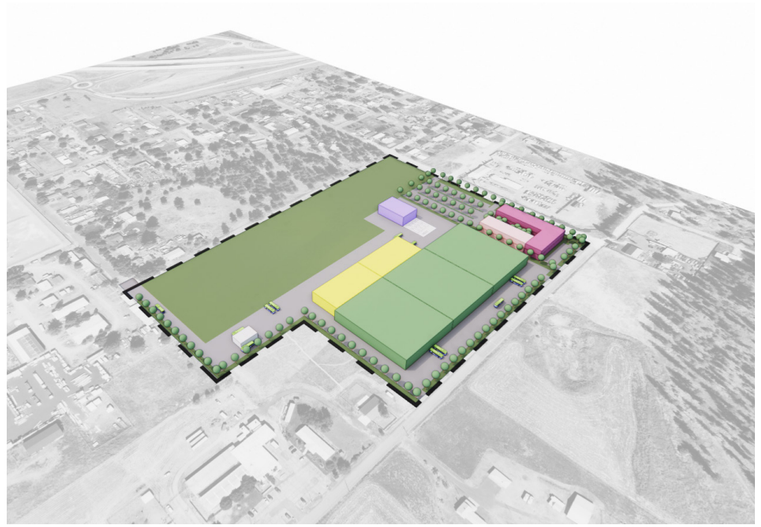



## 2040

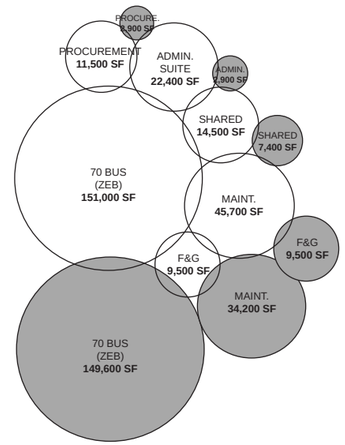
- RENOVATION OF SOUTH BOONE TO CLEAN ENERGY (70 ZEB'S)
- NEW MAINTENANCE BUILDING ON BOONE CAMPUS
- RENOVATION OF NORTH/SOUTH BOONE FOR ADMIN. AND SHARED SPACE FUNCTIONS

# FUTURE OPERATIONS MODELS ANALYSIS
## PREFERRED ALTERNATIVE - MODIFIED NETWORK

# NEW CEB PRIMARY
2030 - DUAL CAMPUS (SIMILAR TO "2C")



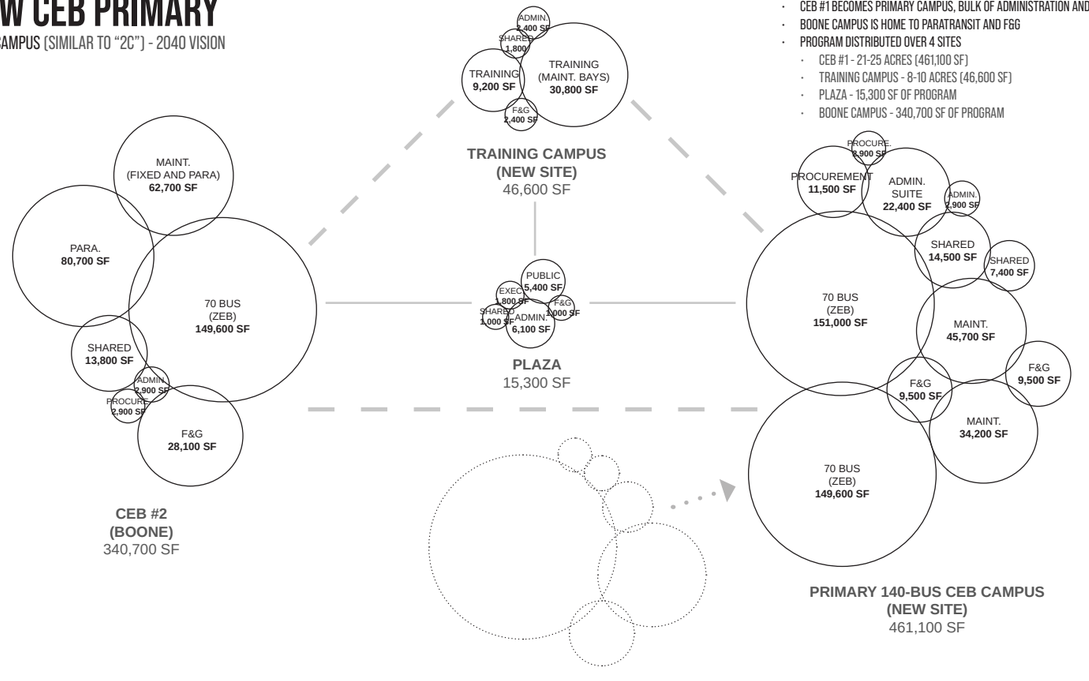
***24-ACRE SITE*** *(14 ACRES SHOWN DEVELOPED)*




**PRIMARY 140-BUS CEB CAMPUS (NEW SITE)**
461,100 SF

## 2030
- PHASE 1 OF NEW PRIMARY ~140 ZEB CLEAN ENERGY BASE

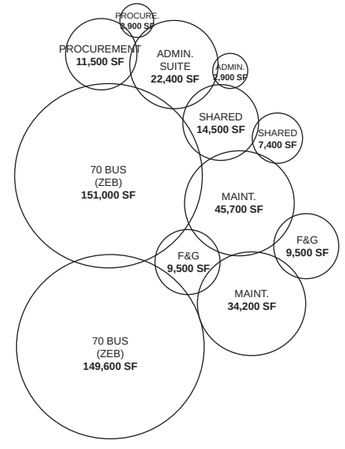
# NEW CEB PRIMARY
DUAL CAMPUS (SIMILAR TO "2C") - 2040 VISION




- NETWORK OF 2 CLEAN ENERGY BASES, ~70/~140 ZEB SPLIT
- CEB #1 BECOMES PRIMARY CAMPUS, BULK OF ADMINISTRATION AND BUS STORAGE
- BOONE CAMPUS IS HOME TO PARATRANSIT AND F&G
- PROGRAM DISTRIBUTED OVER 4 SITES
  - CEB #1 - 21-25 ACRES (461,100 SF)
  - TRAINING CAMPUS - 8-10 ACRES (46,600 SF)
  - PLAZA - 15,300 SF OF PROGRAM
  - BOONE CAMPUS - 340,700 SF OF PROGRAM

# NEW CEB PRIMARY
2035 - DUAL CAMPUS (SIMILAR TO "2C")

***24-ACRE SITE*** *(FULLY DEVELOPED)*




**PRIMARY 140-BUS CEB CAMPUS (NEW SITE)**
461,100 SF

## 2035
- PHASE 2 OF NEW PRIMARY ~140 ZEB CLEAN ENERGY BASE

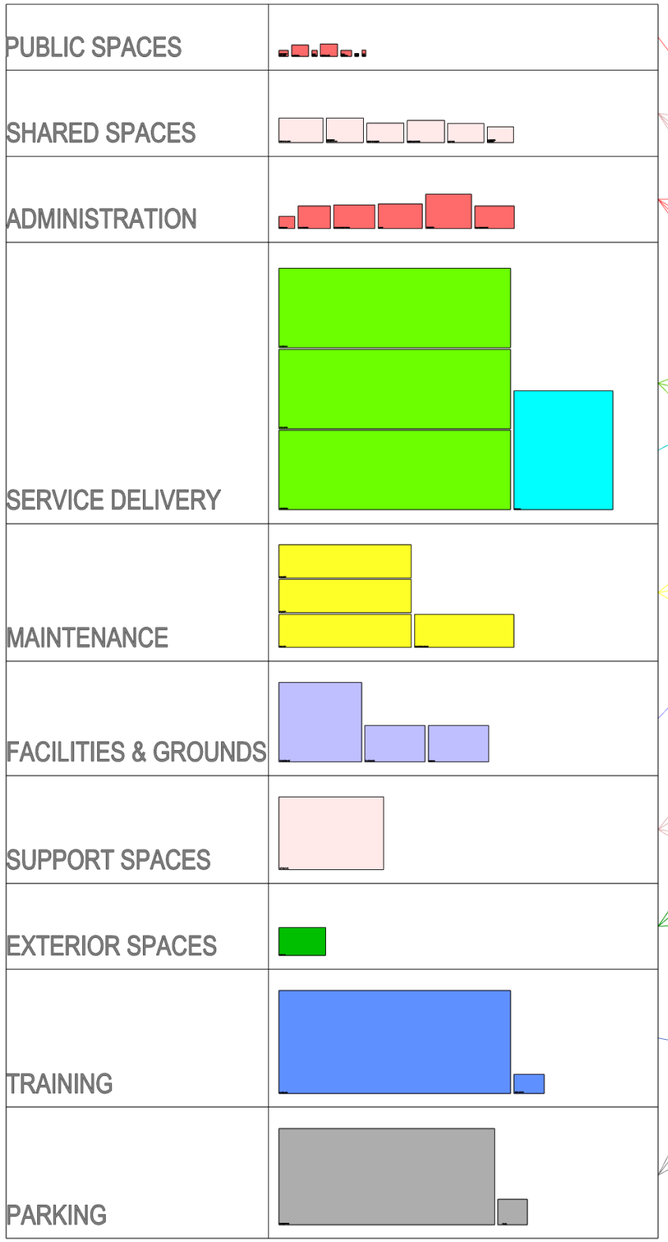
# 7.0 APPENDIX

## V. SITE ANALYSIS

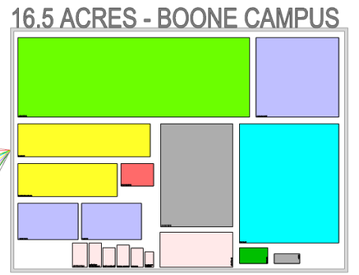
### SUPPLEMENTAL INFORMATION

# SITES STUDY

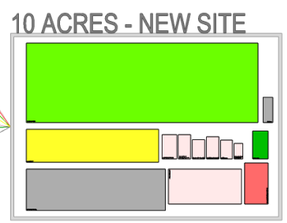
## PROGRAM




## SITES

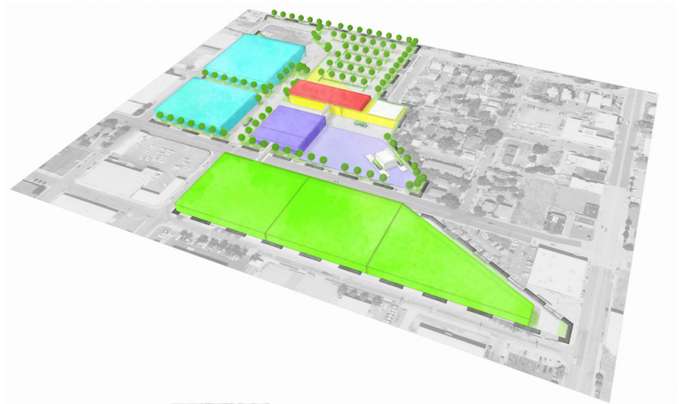


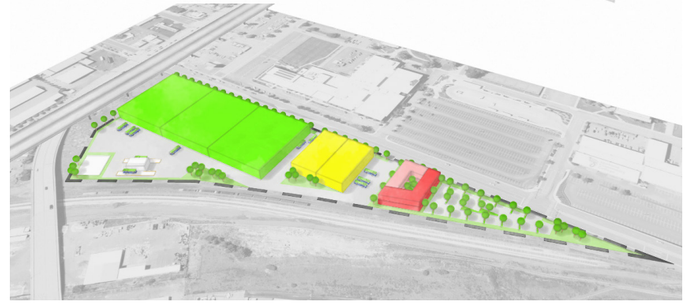


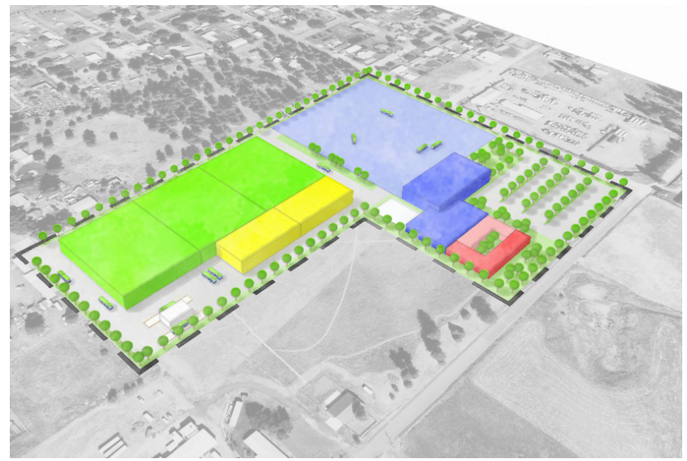





## PROJECTS

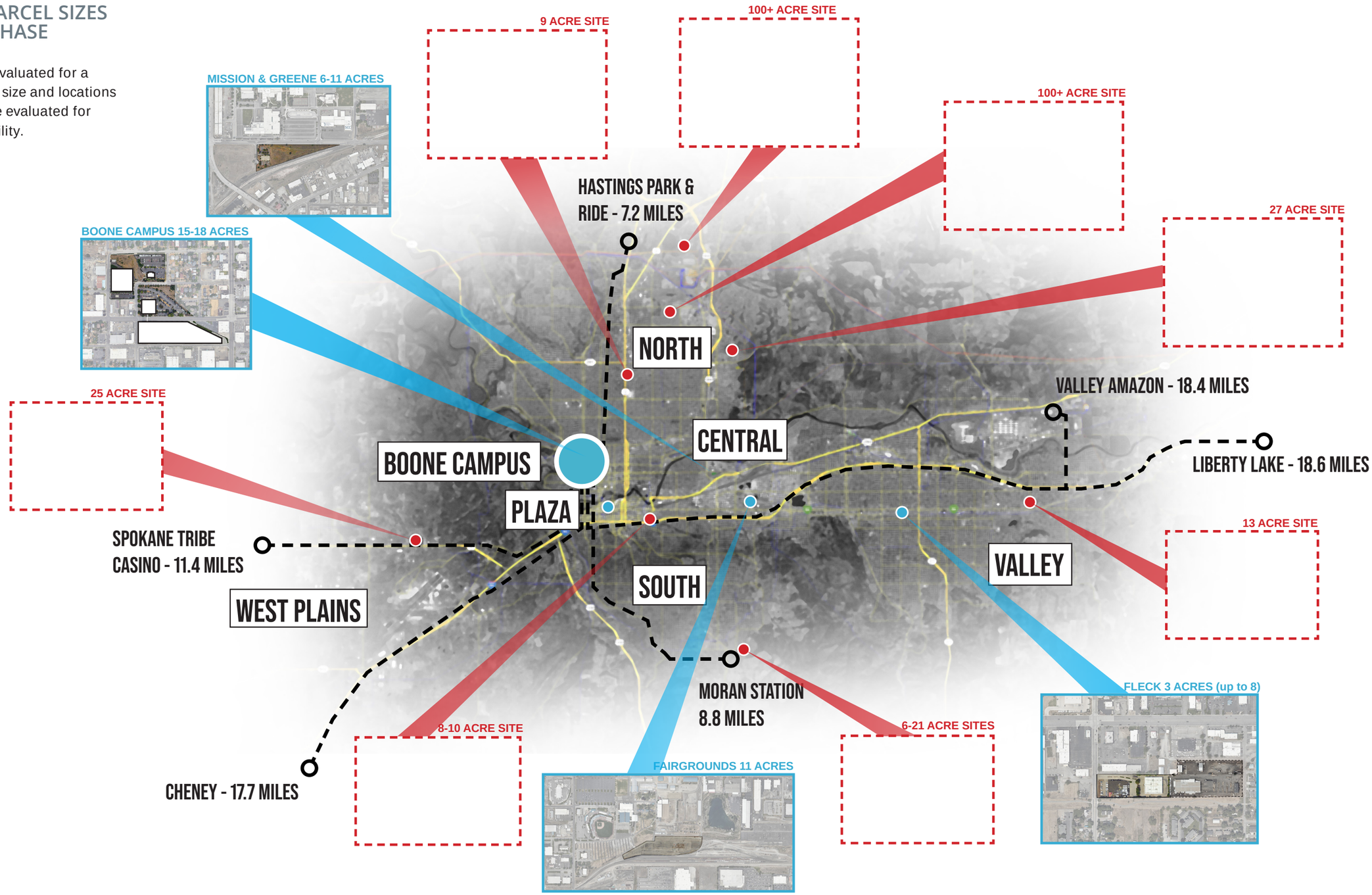






## AREAS OF TOWN AND PARCEL SIZES FOR PROSPECTIVE PURCHASE

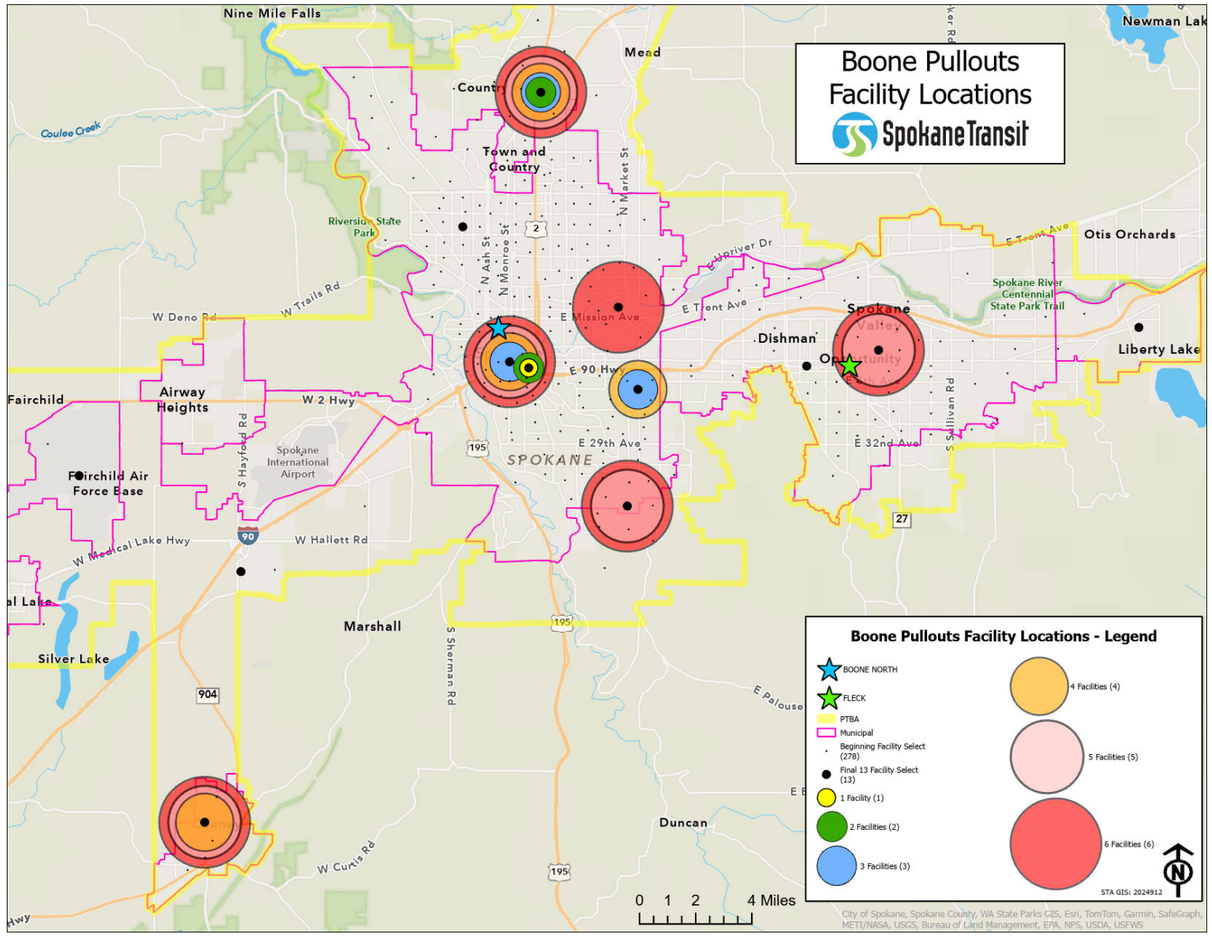
Several new properties are being evaluated for a potential new facility location. The size and locations of the parcels vary, and they will be evaluated for suitability for a new operations facility.

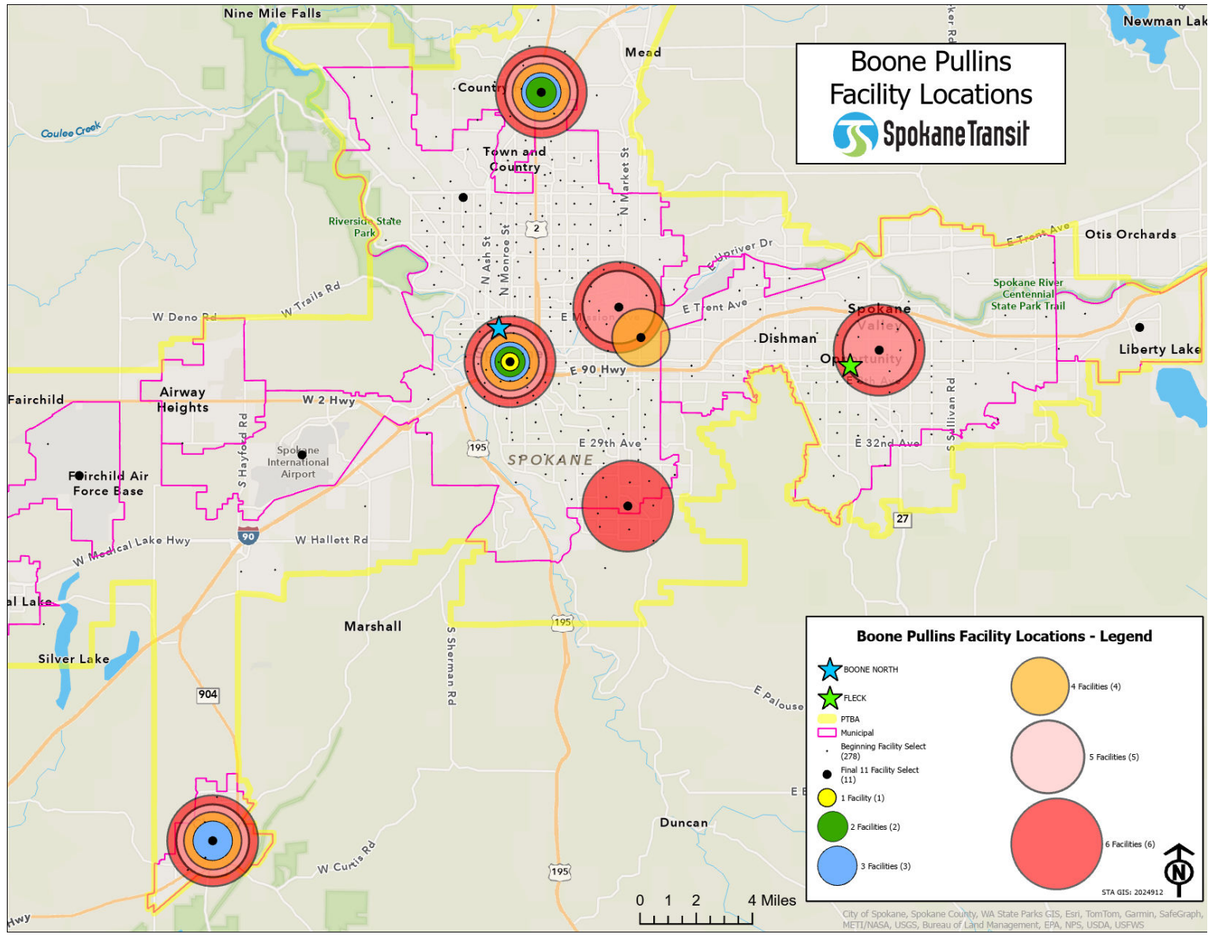


# PULL-OUT & PULL-IN ANALYSIS

## BOONE PULL-OUTS AND PULL-INS

Based on current bus route streets, road classes, pull-out and pull-in information, and first and last stop data for the Boone facility, analysis was run to determine preferred areas of the city for up to six (6) new facilities. Pull-out facility locations are based on buses traveling away from facilities while pull-in facility locations are based on buses traveling toward facilities.

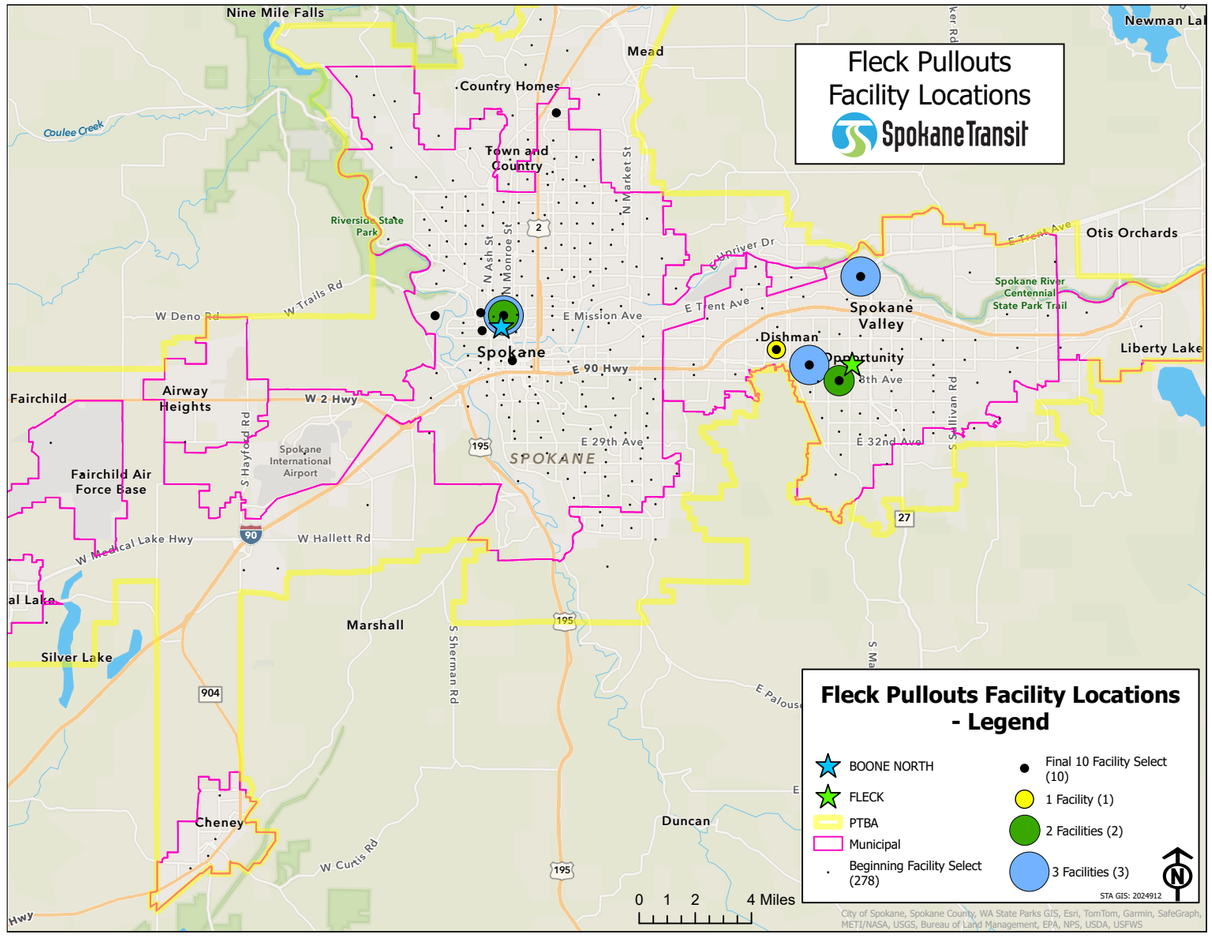


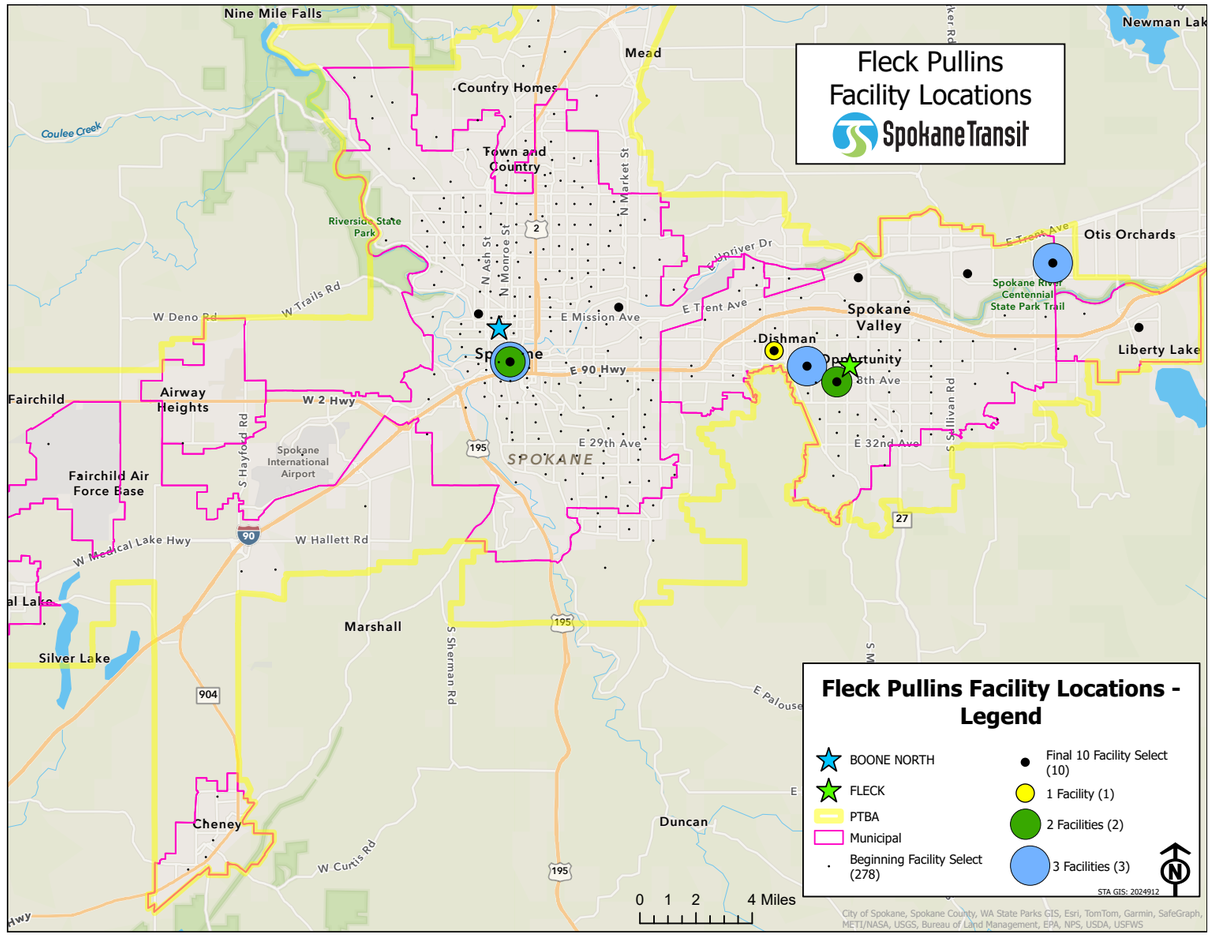



# PULL-OUT & PULL-IN ANALYSIS

## FLECK PULL-OUTS AND PULL-INS

Based on current bus route streets, road classes, pull-out and pull-in information, and first and last stop data for the Fleck facility, analysis was run to determine preferred areas of the city for up to three (3) new facilities. Pull-out facility locations are based on buses traveling away from facilities while pull-in facility locations are based on buses traveling toward facilities.



# 7.0 APPENDIX

## VI. LOOKING FORWARD

### SUPPLEMENTAL INFORMATION

# FUTURE OPERATIONS ANALYSIS
## TRANSITION TO ZERO EMISSIONS