

10th and Yamhill Parking Garage Study and Design Recommendations



Prepared for the

Portland Development Commission
and the
Portland Bureau of Transportation

by

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Executive Summary

The project site is a seven story parking garage with ground floor located at SW 10th and Yamhill in the retail core and River District Urban Renewal Area of downtown Portland, Oregon. It is a part of the Smart Park garage system, owned by the Portland Bureau of Transportation (PBOT). The building was constructed in 1978, and two more parking levels were added in 1984. It has a total of 799 parking stalls used primarily for short term parking. The ground floor holds 27,594 square feet of retail space and maintains five existing tenants. Currently, the garage generates over \$2.5 million in revenue, with net revenue of approximately \$1.2 million. The average weekday peak-time occupancy is between 85-90%.

In addition, the site is the epicenter for multi-modal transit including:

- MAX stations located on Morrison Street (westbound) and Yamhill Street (eastbound);
- Portland streetcar to Portland State University and NW Portland running on 10th and 11th Avenues (with a station located on the north side of the Galleria Building)
- 5 electric vehicle charging stations located on the second floors; and
- Secure bike parking on each level.

The structure is now over 30 years old and requires a series of improvements. It poses a number of design and operational challenges as its wide overhangs, dark corners and opaque stair landings attract loitering and crime. The elevators are particularly slow, the stairs regularly smell foul and the mechanical system serving the retail spaces has been plagued by mold. Its construction in the late 1970's raised doubts concerning its seismic performance; and the pronounced grade change across the block has made compliance with accessibility requirements difficult.

FFA was retained by the Portland Development Commission (PDC) and PBOT to develop a set of recommendations for improvements that will:

- Preserve the building while bringing it into compliance;
- Support the downtown retail presence and multimodal transit goals; and
- Improve the environment at the ground level retail and stairways.

The final recommendations will be used to draft of a Request for Proposal to secure a design and construction team for the renovation of the building.

The site has been subject of several redevelopment schemes over the past 12 years. Scenarios have ranged from large renovation projects to full redevelopment with new construction. As a result of the various contemplations, the building has fallen into disrepair and there are aspects that need to be addressed. However, there have been several analyses conducted on the site spanning the building's design, operational systems, seismic fitness, and elevator and stairways.

One of FFA's initial tasks was to assemble a consultant team and review the previous reports to confirm findings and update with current needs as necessary. FFA then translated the improvements into a design and operations and maintenance scope. The key areas requiring immediate attention are:

- Parking;
- Deferred maintenance;
- Interior and exterior in ground floor retail; and
- ADA compliance

The initial project budget was \$8.5 million. In response, FFA presented a design strategy that targets areas with significant operational and visual impact—the four corners of the building, surrounding storefronts, and building systems.

The greatest impact of these modifications is the consolidation of stairs and elevators at the NE and SW corners rather than retaining a single stair and elevator at each of the four corners. As benefits of making this change, the potential seismic hazard of the existing stair towers is eliminated and the level of service provided by the existing elevators is improved with the doubling of elevator stops available at each location. The vacated corners at the NW and SE are made available for prime retail space, particularly the SE corner which is highly visible from Director Park.

In addition to the reorganization of the vertical circulation, upgrades are recommended to mechanical and lighting systems which will improve energy efficiency and correct existing problems such as equipment aged beyond its functional life, mold growth and light distribution. Structural recommendations for existing issues are focused on maintenance of protective coatings such as the traffic coatings and waterproofing on the parking levels, to protect vital reinforcing imbedded in the concrete and maintaining paint on the upper level steel components, to protect steel integrity from corrosion. FFA and its consultant team confirmed that the building is well-designed seismically, with the exception of the stair towers, and building structure upgrades are not recommended as part of this study.

The estimated cost for the interventions is \$12.1 million (including a tenant-improvement allowance of \$150/square foot) based on 2016 dollars.



View from existing SW 9th and SW Morrison, showing areas of targeted intervention in yellow.

Design Criteria

A variety of design criteria was presented during the initial project discussions that incorporated the needs and preferences of PDC and PBOT. These included, in no particular order:

- Creation of a better image for the building
- Improvement of safety and security
- Improvement of the building's structure and waterproofing systems
- Improvement of retail spaces in order to encourage quality tenants and higher lease rates
- Improvement of elevator service
- Support of alternate modes of transportation
- Compliance with ADA to the extent possible
- Discouragement of loitering and unsanitary uses of the building.
- Replacement or updating of existing mechanical and electrical systems if beyond their useful life or if more energy efficient devices can be utilized.

Methodology

The project team consisted of PDC, PBOT, and FFA. The team maintained a consistent meeting schedule to develop the design and improvement recommendations. During these meetings- the team established a timeline and project milestones; reviewed initial results from the previous studies, and present a series of design recommendations and estimated costs. The team went through iterations of design concepts and cost estimates. PDC also convened a group of local retail real estate brokers and the Portland Business Alliance to weigh in on the design concepts and potential to command a higher rent as a result of the investment. FFA incorporated the feedback into the current design scheme. PBOT also reviewed the various options and alternates with respect to cost and operational impact and determined their preferred recommendations.

FFA managed a consultant team consisting of KPFF Consulting Engineers, PAE Mechanical & Electrical Engineers, Architectural Cost Consultants, and Lerch Bates Elevator Consultants to confirm recommendations from previous reports and update with additional findings as needed through a series of reviews and site visits. The consultant team consolidated recommendations and developed three project scopes (Options A-C) of varying levels of intervention and the costs associated. Option A was intended to be baseline improvements and repairs that would upgrade all aspects of the buildings function and appeal. Option B goes beyond resolution of existing issues to include recommendations to further improve energy efficiency in the mechanical systems. Option C is a series of alternates that could be add-ons to either Options A or B. An estimate for these options was provided at this stage and reviewed with PDC and PBOT. Supporting documents for this process may be found in Appendix 1.



Existing colonnade at Yamhill Street. This walkway and the adjacent storefront sink further below Grade as one walks from east to west on Yamhill Street. As a result this and due to the limited of Connection between the sidewalk and this walkway, it is very difficult to see the retail displays.

Background

The 10th and Yamhill Parking Garage was designed in 1977 by PSDA, Inc. and work was completed in 1978. The initial construction was a pre-cast concrete structure of five floors with first floor shell space to be fitted by future retail tenants and the upper four floors designated as parking levels. Cast-in place concrete with conventional reinforcing was used at floors one through four, but the fifth floor was post-tensioned to better accommodate snow loads. One year later, a second set of drawings was issued to further complete the retail spaces and included interior partitions, a service corridor, stairs to access the service corridor from each tenant space, restrooms and other common support functions, and exterior ceiling finishes within the colonnades on the north and south. In 1984, two more floors were added in steel construction, with the parking decks constructed of concrete supported by steel decking.

The downtown retail core was in various stages of decline during the 1980's and 1990's. The Galleria (adjacent to the north) was falling into disrepair. The block to the east included small-scale established tenants such Zell Brothers Jewelry, Virginia Café and Mercantile in 30s-era low-rise buildings. Block 19, to the southeast, was used for surface parking. Development to the west of the site was starting to become more significant with the completion of the Westside MAX line extension 1998 and the redevelopment of the areas around Civic Stadium (now Providence Park).

In 2002, the City of Portland conducted the Downtown Retail Study which provided recommendations to strengthen the retail core, primarily at Morrison and Yamhill Streets which are the anchors for the district. As part of the strategy, the study cited the availability of well-maintained, short-term parking options via the Smart Park garages (including 10th & Yamhill) as key to driving retail activity. Beginning in 2004, several studies were commissioned on various aspects of the garage including the building's systems, structural integrity, re-design,

and elevators. The building was subject to various redevelopment scenarios that ranged from a full redevelopment to improving the exterior façade. As a result very little improvements have been made at the garage- a combination of deferred maintenance and general upgrades are now required to improve the building's character and bring it into compliance.

The downtown retail core is experiencing a significant amount of investment. Bill Natio Company renovated the Galleria Building and secured a long-term lease with national-retailer Target. The former Zell Brothers block is the site of the soon-to-be-completed 30-story Park Avenue West Tower which will house retail, office space and residences. Block 19, once a surface lot is now Director Park, a vibrant open space used year round. In addition to these redevelopments, Portland now supports a Major League Soccer team, the Portland Timbers and a National Women's Soccer League team, the Portland Thorns, which draw thousands to the west end of downtown Portland during their seasons hosted at nearby Providence Park.

Resources

City of Portland has commissioned a number of studies and reports over the last decade intended to document the building's existing condition and provide recommendations to increase its longevity, function and appeal. As part of our research for this report, FFA reviewed the documents provided by PDC and PBOT. These are located in the Appendix 2 of this report.

- BOOR/A Study, 2004
- Carl Walker/Lerch Bates Study, 2004
- Urban Design Group Study, 2004
- Berger/ABAM Study, 2008
- City of Portland ADA Assessment, 2013
- City of Portland Memorandum on HVAC Options, 2013
- 10th and Yamhill Parking Stall Inventory, 2013
- Sargent Designworks Study, 2014
- Smart Park 10th and Yamhill Transient Parking Report, 2015
- CAD files of floor plans and some remodel/repair projects
 - The CAD floor plans and the pdf set of the Architectural As-Builts reflect an incorrect structural bay dimension and quantity and may have other inaccuracies. The plans indicated in this document have used the CAD files provided by the PDC and PBOT.
- Original and Various Remodel Document Sets, various dates

Existing Conditions

The project team reviewed the existing reports and conducted several site visits to confirm the findings of these reports and update with additional recommendations as needed. The scope of the review pertained to the following areas:

- Site
- Utilities
- Architecture- Parking Garage
- Architecture- Retail
- Structural
- Building Systems: Electrical, Mechanical, and plumbing

Site

The 10th and Yamhill Parking Garage is located on Block 218 in the Central Commercial Plan District in downtown Portland. The zoning setbacks on all sides are zero feet, however, on the north and south elevations, the retail storefront is set behind the property line by five feet, while the parking levels above extend over the property line by five feet. The structural columns that support the upper levels occupy the public right of way on both the north and south sides. The only vehicular entrance to the parking garage is on 10th Avenue. Traffic along 10th Avenue heads north, west on Morrison, south on 9th and east on Yamhill.

The nature of the building's site dictated the first floor elevations and the configurations of the stair/elevator lobbies. The site's slope has 13 feet of fall from the SW corner to the NE corner, with 10 feet of that fall occurring on the 10th Avenue frontage. There is a great deal of variation at floor elevations at the retail tenant spaces as a result of this topographical condition. The variation is managed at the interior by ramped service corridor that most of the retail spaces access by stairs.

As noted above, the building is adjacent to recent, major development. It is also near major attractions including the central branch of the Multnomah County Library, immediately to the southwest, Powell's Books and the Pearl District, four blocks to the north. Retail, consumer service and business activities surround the building on all sides. .



Sidewalk on SW 9th, looking north. There is a great deal of slope along this side of the building and floor elevations vary between 69.5' and 75.5'.



Elevator and stair lobby located at SW 9th and SW Yamhill. The position of the stair and elevator structure blocks view of the retail entrance from Director Park.

Existing Site Utilities

- **Fire Protection**— The first floor spaces are protected with an automatic sprinkler system in accordance with NFPA 13. An existing 8" fire line serves the building and a detector double check assembly is provided for the fire service in a vault in the sidewalk on 10th Avenue. The existing sprinkler piping appeared to be in good condition where it was visible.
- **Sanitary**— Existing sanitary lines serve the common restrooms in the service corridor, the restrooms at Kale Restaurant and an existing single user restroom adjacent to the Garage manager's office at the vehicle entry. Connection to the main is in Morrison Street. According to original drawings, sanitary lines to serve tenant spaces were added as part of the original construction. Most of these lines are not currently in use.
- **Power**— Existing electrical service is brought into the main electrical room located at the top of the entry ramp. The equipment consists of 208/120V 4000 amp bussed multi-sectioned switchboard. Tenant spaces are sub-metered.
- **Water**— Existing water service is via an 8" line that comes from the main in 10th Avenue. The existing water meter and the backflow preventer are in a vault in the sidewalk. The building is served by a 4" domestic water service off of that backflow preventer.
- **Gas**— The gas meter for the property is located at the north service doors in the vehicular entrance on 10th Avenue.

Architectural: Garage

- **Construction**—The garage was built in two phases and of two different types of construction. The original construction is a precast concrete structure with cast-in-place parking decks and sheer walls. The subsequent addition used steel columns with metal deck supported concrete at the parking decks. The sheer walls are placed on the east and west elevations and are expressed on the exterior as solid brick panels. Sheer walls on the north and south sides are located in the retail spaces and the ground floor and within the parking areas on the floors above. Beyond the concrete panels along the ramped areas and at the top floor above the ramp are cable steel guardrails which have lost tension overtime.
- **Stairs**—The stairs are configured as switchback and are cast-in-place concrete with solid concrete guardrails. Each stair is book-ended by solid concrete walls finished in brick to match the sheer panels located on the same elevations. The long edge of the stair is open to the adjacent street. The configuration and materials of the stair make it possible to be easily concealed decreasing personal safety and increasing the likelihood they can be used inappropriately.
- **Elevators**—The existing elevators are hydraulic with a duty of 3,000 pounds and operate at a speed of 100 feet per minute (fpm). Their machine rooms are located adjacent to each elevator at the ground floor. They are used to access the original five floors of the building but the shafts were not extended to reach to the 6th and 7th floor additions. As a result there are no accessible parking spaces on those floors. The back wall of the elevator shaft and the back wall of the cab are glazed allowing views from the elevator out to the street and from the street to the elevator. These units are not suitable for reuse to serve floors 6 and 7 because they are too slow and it is cost prohibitive to install an in-ground

hydraulic cylinder. In their current state, the elevators provide marginal service for the five levels with a large percentage of people using the stairs because of the long waits.

- **Awnings**— Canvas awnings protect the vehicular entrance to the parking garage at 10th Avenue and are used along the 9th Avenue elevation between the sheer walls and at two structural bays on the Yamhill Street elevations. The awnings are in fair shape but require cleaning. The fabric does not allow light to come through which results in dark spaces at the sidewalk.

Architectural: Retail Spaces

- Retail spaces are located on three sides of the block at the ground floor. Both Morrison and Yamhill retail spaces look out onto the street under a colonnade created by the extension of the parking levels over the sidewalk. 9th Avenue spaces open directly on the sidewalk. The spaces are enclosed primarily with aluminum storefront with single pane glazing to a sign band with a solid bulkhead above. Several entrances are worked into the elevation on both the north and south sides where the adjacent paving has been graded to accommodate the entrance. Not all of these entrances are currently being used to access establishment. The grade changes at the sidewalk level are accommodated with a concrete 18 – 24 inch high kneewall that is clad in 2x2 mosaic ceramic tile. In some places this tile has become unattached and bare concrete are visible. The grout has also become soiled over time.



Entrance to the Real Mother Goose at SW 9th and SW Yamhill. Due to its location within the stair and elevator lobby and partially below grade, this retail entrance is obscured from the street



View of the north colonnade on SW Morrison. On the south and north sides of the building, the garage structure extends beyond the property line and into the right-of-way.

- **Grade** — There are a number of finish floor elevations due to the significant grade changes on the block. The lowest elevation is on the NE corner and increases as one travels west on Morrison Street of 9th Avenue. There are three different floor elevations along both streets. The highest elevation is at the SW corner, and the retail spaces on Yamhill Street are at a single elevation. However, grade and finish floor meet at only one location which at the SE corner. All other entrances along Yamhill require stairs to gain access or egress from the retail spaces.
- **Full Service Restaurant Space**—A restaurant, Kale, is currently in operation in the tenant space on 9th Avenue. It is a full-service restaurant and the kitchen grill is exhausted through the building in a chase that extends to the top level. This chase is located near the southeast end of the south sheer wall. Kale also has its own restrooms within its space. The restaurant occupies a large tenant space and has three floor elevation changes that are accommodated with ramps and stairs within the public areas.

- **Service Corridor** — A common service corridor provides back-of house access to common spaces (trash room, storage and restrooms). The corridor floor is cast-in-place concrete and is ramped at both the north and south sides of the building. All retail spaces use stairs to access the corridor with the exception of the existing restaurant on 9th Avenue. Its finish floor meets the corridor elevation and the western most retail space on Yamhill Street as the finish floor meets a landing elevation. Common restrooms are provided at the corridor but the access, fixtures and clear spaces are inadequate and not ADA-compliant. .
- **Accessibility** — The building’s construction in 1978 predated the Americans with Disabilities Act, and as a result, many elements of the facility are not considered accessible by today’s standards. According to the Accessibility Assessment performed by the City of Portland in 2013, many of the exterior sidewalks, entrances and existing accessible parking spaces lack the appropriate cross slopes. Thresholds are too high, handrails are too low, elevator cabs are too small and elevator controls are out of reach range allowances. The assessment did not address the interior spaces of the first floor. Most tenant spaces require stairs to access the ramped service corridor due to the varying floor elevations and the topography of the block. There are no ramps provided in these tenant spaces, barring access to the common restrooms. As mentioned above, the restrooms are also inaccessible due to their layout and fixtures.

At the parking areas, accessible car spaces are provided mainly on the second level. They are massed in groups along the exterior walls of the north and south sides. According to the assessment, the cross slopes at these spaces vary but the majority are outside the acceptable range. They also require that all but one patron in each grouping, pass behind cars that are not their own, a condition that is considered unacceptable today. There is no accessible van parking, due to the low head-height through-out the building.



Existing Elevator Lobby at SW 10th and SW Yamhill. The space is dark and uninviting and cannot provide equal access for persons with disabilities. Access to this area is from the 9th and Yamhill corner.



Existing vehicle entry on SW 10th. The canvas awning does not allow light to filter through, may be prone to color fading and requires cleaning and maintenance.

Structural

- **Superstructure** — The existing structure of the garage is pre-cast concrete at floors one through five and steel at floors six and seven. The project team confirms that the current condition of the structure is consistent with the findings in the Sargent and Bergen/ABAM reports. The building has a good lateral system with well-placed shear walls that are tied together with the concrete slabs. It likely would not meet current seismic code for detailing and force levels but can be expected to perform well for its age. The existing stair towers are the only major seismic hazard as they are minimally tied back to the building and could pull away in a seismic event.
- **Waterproofing** — The current condition of the slabs and coatings at the parking levels is also consistent with the analyses in the Sargent and Bergen/ABAM reports. There are cracks in the concrete slabs and beams, some concrete spalling, corrosion at steel girders and some ponding. The areas of spalled concrete are not extensive enough to indicate corroding rebar. Traffic slabs in some areas are worn down and no longer provide the same level of protection as at the time of installation. Areas of corroded steel are minor and do not appear to be indicative of a systemic problem or degradation of the member's capacity.



Corrosion at steel members



Crack visible at concrete slab.

Mechanical (HVAC System)

The existing mechanical system is comprised of a gas fired boiler located in a boiler room adjacent to the entry ramp on the north side of the garage. It has a copper heat exchanger and is rated at 80% efficiency. The boiler and the existing chiller provide heated and chilled water, respectively; to the existing air handler located in a mechanical room adjacent to the boiler room.

The boiler is 19 years old and is at the end of its functional life. This finding varies from the previous assessment by the City of Portland in 2013, where the boiler was deemed to still have life and did not require replacement. New boilers of the same type are now rated at 92% efficient which will result in energy cost savings for the City. The chiller is approximately 14 years old and is approaching the low end of its function life range. It is secured by a chain link enclosure on the top level of the building.

The air handler is in good condition. However it has a manual switchover between heating and cooling which causes discomfort in the colder months when demand for heating and cooling changes frequently. There may be mold growth within the equipment that would require abatement. The retail spaces served by the air

handler are zone controlled by 24 variable air volume terminal units. These are located in the retail ceiling space. Individual terminal units are provided with electric heating coils for space heating.

Ventilation to the retail spaces is provided through outside air dampers (OSA) and distributed via metal ductwork. The OSA dampers are closed due to the presence of mold. When the dampers are opened and air is flowing through the system, an odor of mold is perceptible in those spaces. As a result of having no fresh air ventilation, the air quality in the spaces is poor and feels stale and stuffy. The parking garage levels are naturally ventilated.

Electrical

- **Main Service**— The existing main distribution is located on the ground floor in the main mechanical room. The equipment consists of a 208/120V, 4000amp bussed multi-sectioned switchboard. Utility meters have been provided for each tenant space. A mechanical panel is located in the same space and appears to serve all house loads. An existing 208-408 step-up transformer serves the existing chiller on the roof. The electrical equipment appears to be in good condition.
- **Lighting**— The existing lighting in the garage and some of the retail spaces are linear fluorescent fixtures. An existing timeclock control system is in place to sweep on/sweep off the fixtures automatically.



Light fixture at flat concrete slab ceiling



Light fixture at metal deck steel beam ceiling

Plumbing

- **Fixtures**— Plumbing fixtures located in restrooms on the service corridor appear to be original to the building and are not water-conserving or ADA-compliant. Water-closets are floor-mounted, tank type. Lavatories are wall-mounted with non-compliant controls.

Streetcar Substation

- **Substation Room** — In the year 2000, a traction power substation was built on the 2nd floor of the parking garage to serve the Portland Streetcar, near the 10th and Yamhill corner. The room is of CMU construction with a pair of double doors on the south wall, a single egress-only door on the east wall and a single access door on the north wall. Upon its construction, the room displaced 2-3 parking spaces. The existing 208Vac power at the building is converted to 750Vdc and is provided to the street car via cables that penetrate the concrete sheer wall on the west side of the building. A large pull-box and conduit that extend below the sidewalk conceal the cables.



Portland Streetcar Substation Room, view of SE corner.



Electrical equipment housed in Substation Room.

Recommendations

The project team developed three improvement scenarios (Options A-C) with Option A representing the baseline of improvements required to bring the building into compliance and maintain the building's character. The following are descriptions of those improvements identified in Option A which was the selected option.

Architectural: Garage

- Parking Space Size** – The current parking space widths vary from roughly 7'-0" to 8'-0", with 9'-0" wide ADA spaces. The garage may need to be restriped to meet the Portland Zoning Code requirements for a minimum parking space size of 8'-6" wide at angled parking. This combined with the reallocation of accessible parking spaces from grouped locations to individual locations (described below), the reconfiguration of the ramp to the 3rd floor Skybridge and the distribution of the existing structural columns reduces the number of parking spaces from 799 automobile stalls to approximately 671 automobile stalls and 12 motorcycle spaces. (The plans in Appendix D assume zoning code compliance.) Given the hardship this presents to the operation and profitability of the garage, a case could be made for an adjustment to lessen or eliminate the requirement to meet current code standards. The following are tallies for the present striping condition and approximate counts for other scenarios:

present typical space width, present plan:

| Level | General | Motorcycle | Bicycle |
|-------|---------|------------|---------|
| L2 | 82 | | 4 |
| R2-3 | 48 | | |
| L3 | 92 | | 2 |
| R3-4 | 48 | | |
| L4 | 94 | | 2 |
| R4-5 | 48 | | |
| L5 | 94 | | 2 |
| R5-6 | 48 | | |
| L6 | 94 | | |
| R6-7 | 48 | | |
| L7 | 103 | | |
| | 799 | 0 | 10 |

7'-9"+ typical space width:

| Level | General | Motorcycle | Bicycle |
|-------|---------|------------|---------|
| L2 | 81 | 1 | |
| R2-3 | 44 | | |
| L3 | 77 | 2 | |
| R3-4 | 44 | | |
| L4 | 84 | 2 | |
| R4-5 | 44 | | |
| L5 | 84 | 2 | |
| R5-6 | 44 | | |
| L6 | 84 | 2 | |
| R6-7 | 44 | | |
| L7 | 91 | 2 | |
| | 721 | 11 | 0 |

present typical space width, new plan:

| Level | General | Motorcycle | Bicycle |
|-------|---------|------------|---------|
| L2 | 86 | | |
| R2-3 | 48 | | |
| L3 | 85 | | |
| R3-4 | 48 | | |
| L4 | 89 | | |
| R4-5 | 48 | | |
| L5 | 89 | | |
| R5-6 | 48 | | |
| L6 | 89 | | |
| R6-7 | 48 | | |
| L7 | 99 | | |
| | 775 | 0 | 0 |

8'-6" min. typical space width:

| Level | General | Motorcycle | Bicycle |
|-------|---------|------------|---------|
| L2 | 73 | 2 | |
| R2-3 | 44 | | |
| L3 | 71 | 2 | |
| R3-4 | 44 | | |
| L4 | 74 | 2 | |
| R4-5 | 44 | | |
| L5 | 74 | 2 | |
| R5-6 | 44 | | |
| L6 | 74 | 2 | |
| R6-7 | 44 | | |
| L7 | 85 | 2 | |
| | 671 | 12 | 0 |

- **Accessibility** –The distribution of the accessible parking should be a single space at each elevator location on every floor to ensure that no disabled patron must pass behind another patron’s car on their way to the exit. There is an inefficiency realized with locating individual accessible spaces rather than grouped as two spaces cannot share a common access aisle. It may be possible to add a second space at each location across the aisle from the first, however, the cross slopes may be too great to overcome and would not yield increased efficiency. An additional space at the third floor adjacent to the ramp to the Skybridge would also be added. The ramp to the Skybridge is recommended to be removed and rebuilt in a configuration that meets ADA for proper slopes, rails and discharge.

Due to the existing construction, it is not feasible to create a van accessible space within this facility. The only space tall enough to accept an accessible van is at the vehicular entrance where there is no space available to devote and where existing slopes cannot be modified to create a flat enough space.

- **Parking Guardrails** — Some of the existing pre-cast concrete guardrails are not of adequate height. The project team proposes adding a pipe rail extension similar to what is currently installed at the 5th floor to provide the additional height where necessary to meet code. Because it would be installed inboard of the concrete rail, it will be less noticeable than installed on top of the rail.
- **Stairs and Elevators** – As noted earlier in this report, the concept of our approach was to perform targeted interventions, rather than wholesale renovation, in order to capitalize on the funds available. We propose neutralizing the appearance of the existing parking garage structure as a ‘foil’ to the new stairs and elevators, and new retail corners. We recommend steel and glass as the primary materials for the stairs and elevators that will provide a delicate, transparent counterpoint to the heavy, solid elements of the garage. The following are a list benefits that will result from the reconfigured vertical transportation elements:
 - Expanded perspective views of the adjacent streets, buildings and open areas via glass rails and a series of platform landings;
 - Increased safety for riders as a result of the glass sided elevators and elevator shaft.
 - Improved level of service from the higher velocity elevators and consolidated locations that will extend service to the 6th and 7th floors;
 - ADA compliance through increased elevator size and the inclusion of a gurney-sized elevator will enable emergency personnel to transport injured patients off all parking levels.
 - Consistent architectural aesthetic by using non-combustible wood-look products under each landing to tie back to the existing wood ceilings in the colonnades and house light fixtures to increase security at those corners and on the stairs.

The location of the stairs was revised during the study process, it was first thought that the NW and SE corners would be the best locations for vertical access due to the proximity to Target’s main entrance and Director Park, respectively. As the study progressed, however, it became apparent that Target was interested in reopening the Skybridge providing direct access from the parking garage to their store in that approximate location. It also became apparent that the corner facing Director Park would have a strong retail presence due to its location. It was at that point that the stairs switched and are now recommended to be at the NE and SW corners.

Maintaining four total elevators and increasing their velocity is recommended to improve the level of service to the parking levels. The recommended duty for stretcher car elevators is 4,000 pounds at 350 feet per minute (fpm) with single speed center opening doors. For all other cars we recommend 3,000 lbs. at 350 fpm. The type of equipment recommended is machine-room-less (MRL) gearless traction

elevators. In order to fit two side-by-side elevator cars in the preferred locations, customized service elevators are recommended. Rather than entering the cab on the long side, service elevators are entered on the short side. This is particularly beneficial at the stretcher car to avoid maneuvering an emergency stretcher. All of the elevators' sides should be glazed for the greatest visibility.

- **Alternative Transportation Parking**

- **Electric Vehicles** – Additional spaces for electric vehicles are recommended to serve the increasing number of plug-in vehicles in the marketplace. These vehicles are to be given prime parking spaces at the perimeter and on the lower floors to incentivize their use.
- **Secured Bicycle Parking** – To meet PBOT's policy goals for multi-modal transportation, one of the intention of PDC and PBOT that one of the tenant facilities on the ground floor become a bicycle parking business rather than provide bicycle parking throughout the parking levels. This will ensure that bicycles and cars do not have to cross paths within the space, bicycles do not have share space with pedestrians in elevators and a great deal more bicycles may be accommodated. The location preferred for this function is Retail Space F.

- **Architectural: Retail**

Storefronts – Upgrading materials at the retail level will provide a great deal of improvement for the spaces both visually and mechanically. Replacement of existing single-glazed storefront will require a new thermally broken storefront system and glazing that will improve performance and meet current energy code. FFA recommends using natural aluminum for the new storefront framing to create a light and modern aesthetic. Storefronts will sit on existing and new concrete knee walls which are recommended to be clad in metal panel with solid backing. This eliminates the possibility of freeze-thaw and reduces maintenance issues experienced with the ceramic tile and grout.

The sign band will continue to be used for signage, but rather than the flat signage currently in place, it is recommended that signs installed perpendicular to the wall be used to provide some relief to the flatness of the wall and to allow approaching pedestrians and vehicles to ability to see the signage before arriving at the space.

The colonnades on the north and south of the building have existing wood ceilings that are recommended to be refinished and remain. Lighting in these areas should be improved for safety purposes, but also for architectural purposes. The use of non-directional light fixtures, suspended where height allows, will bring down the scale of the space and allow the ceiling to be lit, as well, calling attention to the warm wood in the midst of glass and concrete.

- **Tenant Spaces** – The building's retail area will be expanded at two of the building's corners (SE and NW) as a result of the consolidation of the stairs and elevators to opposite corners. The SE corner in particular, opposite Director Park, will have a great deal of presence as it faces the open space. To take advantage of this location, the recommended scheme includes increasing the retail area and creating an entrance pavilion that one would enter through to access the retail space. This could also be fully enclosed to add more retail square footage, however, the entrance would forced to the 9th Avenue frontage due to existing property line grades at that corner. These retail corners would be constructed of the same materials as the stair and elevator towers to provide a visual connection between the elements.

At the Northwest corner, it is recommended that this space be fully enclosed and contiguous with the adjacent tenant space. However, the same entry configuration could be used at this location as at the SE corner.

In order to provide access to each retail space, the grade directly outside the space and along the accessible route to it will need to be modified to allow for proper cross slopes. The existing entrance to the Real Mother Goose display window on Morrison Street is recommended to be moved to the east to create another retail space of similar size to the others on that frontage. Due to existing grades at that location, the floor elevation should be raised throughout the space using a relatively lightweight system of concrete on metal deck, to allow the space to be reconfigured with the adjacent space to the east, if desired. This is also recommended at the space currently being occupied by Peterson's where the existing entrance is raised above the finish floor level requiring the use of a ramp once inside the door.

Common Tenant Spaces – An accessible route can be provided to the service corridor by means of ramps in each tenant space. It may also be possible to get vertical lifts approved for this use. Vertical lifts are not usually considered equal to ramps and need variances in order to be installed, however, the nature of the existing conditions at this building may be considered enough of a hardship for a lift to be approved. For the purposes of this study, ramps are shown and estimated for use in each area. Group restrooms are recommended to serve all of the tenant spaces, accessed in the service corridor. These spaces would be finished in a manner to be used by both the public and employees of the tenants. A large storage room is provided in the corridor for use by a tenant or could be configured to serve several tenants with individual locking spaces within the room. Tenants may also choose to create their storage areas within their spaces.

The existing trash room at the NW end of the corridor is recommended to be expanded to better serve tenant trash and recycling volumes.

Finishes

- Exterior: The parking structure be painted a single, neutral color to allow it to recede to the background and provide a 'foil' for the new stair towers and retail corner renovations. The brick panels would also be painted to blend with the façade.
- Interior: The garage interior is currently painted white and we recommend it remain white in order to maintain the existing level of brightness. Steel on the upper levels need to be repainted and the color should be white to provide a consistent appearance from outside the garage in addition to maintaining brightness.

Structural

- **Waterproofing and Repairs** – The project team's recommendations coincide with the Sargent Designworks report recommendations as the existing conditions have not changed significantly since the report was produced in 2014. These include:
 - Apply a traffic coating or sealer on the floor slabs, possibly just at the drive lanes, or rout and caulk the individual significant cracks. The second floor would require a traffic coating over the entire slab to protect the retail space below.
 - Remove the existing sealant and re-seal at both side of the pourstrip.
 - Remove all unsound concrete, clean the reinforcing, and install an epoxy based cementitious repair mortar at spalled and loose concrete
 - Inject epoxy into the spandrel beams at cracks to prevent moisture getting to the reinforcing.

- Remove chipped paint and corrosion from the steel framing on the upper two floors and repaint.
- Eliminate ponding on the 4th level by filling in the low areas with an appropriate leveling compound or add new drains at the low spots and connect to existing drain lines.

The elements of the Berger/ABAM report which focused on seismic upgrades were based on a previous proposed design scheme which added large concrete panels to the exterior of the structure. The current recommendations do not propose such mass additions which would require seismic upgrades and the recommendations of the Berger/ABAM report do not apply.

- **New Structural Elements** –The existing stairs and elevators in each corner will be removed and replaced with new stairs and elevators in the northeast and southwest corners. The new towers will be steel framed and tied back to the existing garage at each level. The floor ties will include steel plates and angles epoxy bolted to the existing concrete beams. These ties will be welded to the steel structure at the upper two levels. The landings and new floor areas of the towers will consist of concrete topping on metal deck. The cantilever steel stair stringers will require welded moment connections at the landings. All columns of the new towers will have to align with the existing masonry walls being removed to ensure the new tower is supported by the existing piles and grade beams. If not, new grade beams would have to be added to span to adjacent piles.

The existing elevator will be removed and reconfigured to accommodate two elevators at the NE and SW towers. This will require some slab removal in the existing garage to accommodate the new elevator locations. At the concrete structure, new steel beams will be added under the slab to frame out the new opening. At the 4th level, the existing post-tensioning cables will require new anchors to be installed at the new slab edges. At the upper two levels, the steel framing will be cut out and re-framed as necessary for the opening.

At the opposite ends of the new towers (NW and SE corners), the newly-gained square footage will be enclosed to incorporate retail space. The enclosures will be steel framed with glass storefront will vary in height. The new steel columns will need to align with the existing foundations. The roof will be metal deck and tied back to the existing second level. A new slab-on-grade will be required with curbs at the new storefront.

New steel and glass awnings will be added over the drive aisles on the west side and at the retail space on the east and south sides. The new awnings will be epoxy bolted to the existing concrete spandrel beams and columns. The five foot wide awnings at the drive aisles will require diagonal hanger rods or cables. The three foot wide awnings at the retail sides can be bolted directly to the structure without hanger rods. At the top of all perimeter spandrel beams, a new cable rail will be added. The cable rail will be supported by steel clip angles bolted to the top of the existing spandrel beams.

A seismic upgrade is not required for the garage. While the existing structure would likely not meet current code seismic requirements, the renovation is not affecting the existing lateral elements and the occupancy category is remaining the same, therefore, no upgrade is required by the Building Code or the City of Portland.

Mechanical (HVAC equipment)

- All existing ductwork and air handling equipment require replacement. If the existing air handler were to remain, it must be mold-abated and serviced. Existing controls systems are to be upgraded to provide automated switch-over between heating and cooling. Outside air dampers are to be opened and allowed to modulate open and closed as needed.
- Air cooled chiller is to be replaced with new high-efficiency model of similar capacity. Existing pump is to be serviced and provided with new seals.
- Boiler is recommended to be replaced with new high efficiency (rated at 92% efficiency) condensing boiler of similar output capacity. Existing pump is to be serviced and provided with new seals.

Other Systems Considered

- **Hydronic Reheat System (previous Option B)**
Hydronic reheat terminal units would be provided at retail spaces to replace the existing electric resistance reheat at the existing terminal units. A heating water loop is extended from the boiler to the retail spaces and connected to each terminal unit. The benefit of this type of system is that it uses a more efficient heat source than electrical resistant heat. The disadvantage is first cost and the cost associated with having to re-pipe the portions of the system when renovations are made.
- **VRF System (previous Option C):**
A high-efficiency Variable Refrigerant Flow (VRF) heat recovery system utilizes heating and cooling rejected from one space to heat or cool another space. It also allows for odor control from one space to another as it isolates all air recirculation at the zone level. It would require air-cooled heat pumps be located on the top level of the garage in place of the chiller. From there, refrigerant piping is routed from heat pumps to heat recovery distribution boxes and fan coils in retail ceiling space. The fan coils, zoned similarly to the existing terminal units, would provide heating/cooling. The system would also require distribution ductwork from fan coils to air inlets/outlets to be provided. The benefits of this system are that it is highly efficient and can be easily expanded or modified as tenant needs change. This disadvantage is first cost and the inability to use portions of the mechanical system already in place.

Plumbing (Plumbing equipment) – Two new group restrooms consisting of a several lavatories and floor-mounted water closets are recommended to be provided in existing spaces accessed from the service corridor. The existing restrooms are recommended to be upgraded with new fixtures in the current configuration. Signage at the doors would indicate the new restrooms as accessible. Existing cold water and plumbing vents are to be extended from the existing locations to each new restroom. New waste lines would be extended from existing waste lines under the slab. Rather than install a new tank water heater and associated piping, instantaneous point of use water heaters (4 kw) provided under the lavatories to generate hot water.

Fire Protection – As a result of the relocation of the existing stair and elevator tower, the existing Fire Department Connections and the standpipes currently located in the stairways will be demolished. New Class II standpipes per the requirements of OSCC Section 905.1.2, local Fire Marshal requirements, and NFPA 14 will be provided at the two new stair tower locations and at two locations within the garage near the ramp ends. Hose valves will be located in secure areas. At the ground floor, any modifications to the existing sprinkler system due to ceiling replacement or head relocation shall comply with NFPA 13 and local Fire Marshal requirements.

Electrical (Lighting) – In the garage, FFA recommends the existing fluorescent light fixtures be replaced with new linear LED with on/off drivers. Light fixture quantity could be increased to provide greater light distribution, particularly at the fifth and sixth floors where the steel beams may restrict light distribution, however the cost estimate associated with this study assumes replacing the existing fixtures close to their current quantity, with some additional fixtures included for flexibility. It is also recommended that the existing timeclock system be replaced with a new programmable lighting control relay panel in main electrical room on ground floor. Surface-mounted lensed linear fluorescent are recommended for the new restrooms and to replace the existing fixtures in the existing restrooms. In addition, wall switch occupancy sensors are to be incorporated to meet energy code and GFCI receptacles will be provided each new restroom.

In order to provide better lighting conditions at the ground floor colonnades, it is recommended that LED accent lighting be provided, installed in the existing wood ceiling. At the stair landings, LED can lights are proposed to be installed under each landing to light the landing or ground below.

Other Systems Considered

- Daylighting photocells: The use of photocells to control perimeter garage lighting. The advantage is to provide realize energy efficiency. First cost increase on lighting materials and installation is the disadvantage.
- Photovoltaic (PV) Array: The use of a PV system could offset electrical costs for the facility, with unused power being fed to the grid via a net metering arrangement. The PV configuration was proposed to act as a sun shade for the perimeter spaces at the top floor. PV array generates electricity and feeds into the grid via a net metering arrangement. There are considerable first costs associated with the system in addition to structural considerations.

Substation Room – With the relocation and expansion of the stair and elevator tower in the SW corner of the block, the substation room will need to be reconfigured in order to continue providing access to the electrical equipment. FFA recommends the room be expanded to the south. This would mean the elimination of the double doors on the south wall. The single door on the east wall would be replaced by a pair of double doors to allow egress of personnel and equipment maintenance and replacement. Rooms housing equipment of this size typically require two means of egress. However, OESC 2014, 110.26(C)(2)(a and b) provides exceptions for rooms with clear and unobstructed paths of egress and for areas with doubled working space in front of the equipment, two conditions that appear to be met with this configuration.

Cost Estimate

The cost estimate, attached in Appendix F, reflects the recommendations made in this study report and allows for several other elements that will affect the direct construction cost of the project, including contingency, escalation (which assumes a construction start in 2016), public art percentage, General Conditions and contractor overhead and profit. The estimate also includes a line item for a Tenant-Improvement allowance of \$150/square foot.

Assumptions

The ADA Assessment was added to the scope of the project documentation after FFA's proposal for the project was approved. Because the City of Portland's assessment was completed recently, it was determined that the assessment was still accurate and information could be used by the project team without additional verification in the public areas. However, the project team did review existing conditions in the back-of-house and retail areas to determine which elements needed to be brought into compliance with accessibility standards. These upgrades are included within the recommendations of this study report.

Code Information

1977 – 1978 Original Construction, including retail shell space (Oregon State Building Code – 1974, based on 1973 Uniform Building Code [UBC])

- Occupancy: F-3 (garage with existing accessory B-1 occupancy space), F-2 (retail spaces), B-2 (restaurant spaces)
- Construction Type: I (Fire sprinklers provided at retail spaces)
-

1984 Parking Level Addition (Oregon State Building Code – 1983, based on 1982 UBC)

- Occupancy: F-3 (garage)
- Construction Type (addition): II-N.

Current - for new or remodeled elements (Oregon Structural Specialty Code – 2014, based on 2012 International Building Code [IBC])

- Occupancy: S-1 (garage with existing accessory B occupancy space), M (retail spaces)
- Construction Type Conversions from UBC: Type I-A (floors 1-5) and Type II-B (floors 6-7)

Live Loads

| | |
|--------------------|---------------------|
| Roof | 25 psf + Snow Drift |
| Commercial Floors: | 100 psf |
| Stairs: | 100 psf |

Lateral Loads

Seismic

SS = 0.988 g, S1 = 0.425 g
Site Class D (assumed) Yes
SDS = 0.728 g, SD1 = 0.446 g
R = 5, $\Omega_{2.5} = 3$, Cd = 5
IE = 1.0, Seismic Design Category C (based on SD1)
hn = 100 ft, T = 0.063 sec, CD = 0.146

Wind

Basic Wind Speed = 130 mph (3-second gust)

Exposure Category B
Enclosure Classification = Enclosed (ground floor)
hn = 100 ft

Codes and Standards

Recommendations are based on the following codes and standards:

- Portland Zoning Code
- Oregon Structural Specialty Code (2014 edition)
- Oregon Energy Efficiency Specialty Code (2014 edition)
- Oregon Mechanical Specialty Code (2014 edition)
- Oregon Electrical Specialty Code (2014 edition)
- Oregon Plumbing Specialty Code (2014 edition)
- Architectural Barriers Act Accessibility Standards (ABAAS)
- Oregon Elevator Specialty Code (2011 edition)

















