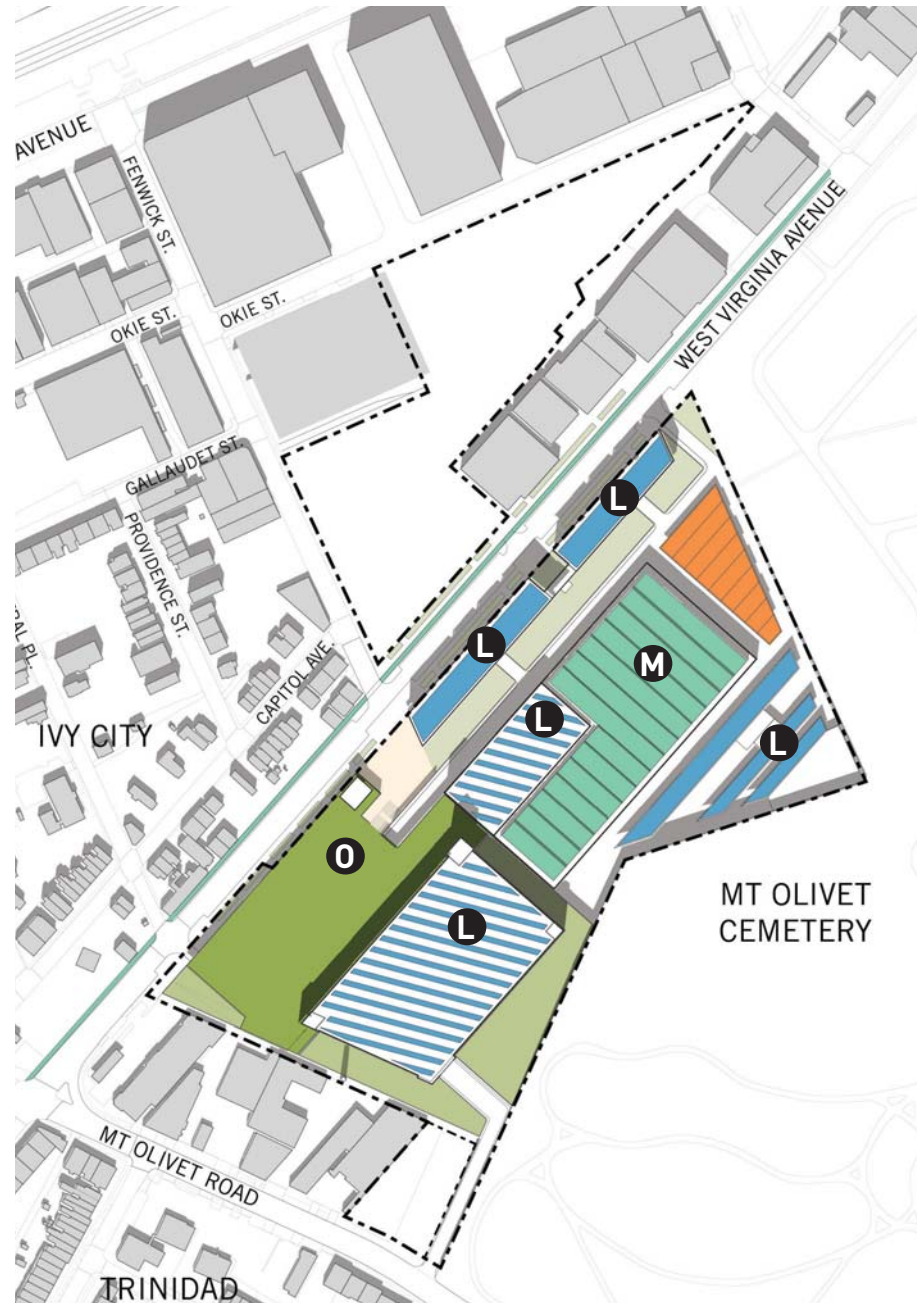


LEVEL TWO



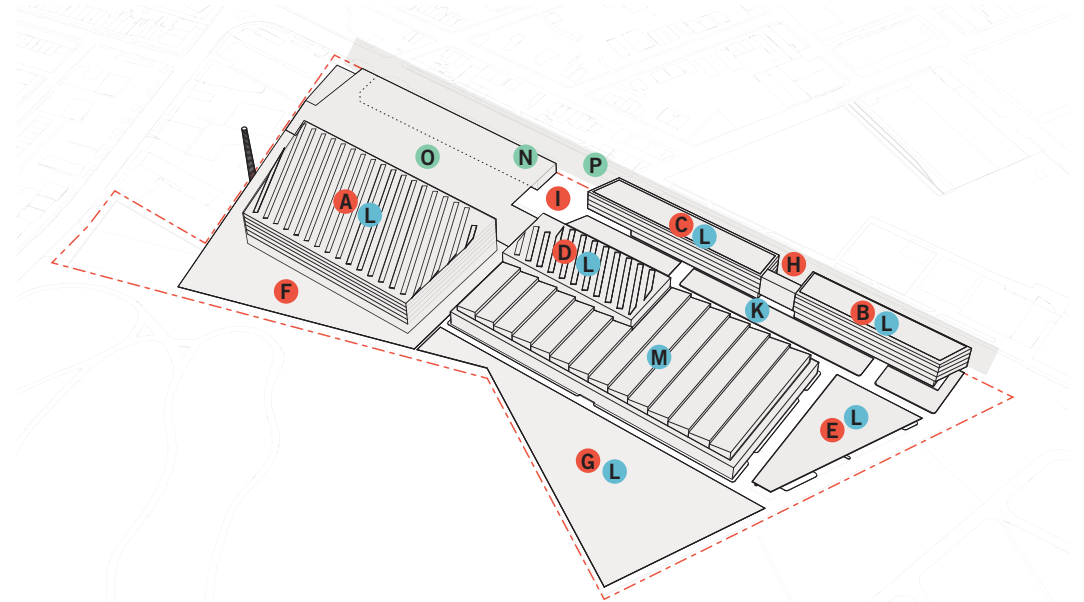
ROOF LEVEL

ENHANCED SUSTAINABILITY INVESTMENTS

This state-of-the-art campus aims to be a net zero project with progressive goals for the production of energy, efficient stormwater management and optimal building performance. These sustainability measures align with the District's Sustainable DC plan exceeding LEED Platinum building requirements.

The campus serves as a pilot project in the District for net positive resilient campus design. These sustainability investments will drive economic growth, and in the face of climate change, will mitigate unknown or increasing utility and resource costs. The new facilities can also be a catalyst for economic development and create a ladder of new jobs to bolster the local economy. Green building is equally about economic and social sustainability as it is about reducing greenhouse gas and being a good steward of the environment.

The net zero energy plan proposes buildings that are designed to minimize energy consumption, resulting in a 40 to 50 percent reduction in baseline energy use. This will ultimately determine how much renewable energy is needed to make up the remaining energy demand. The buildings include Ground Source Heat Pumps to provide heating and cooling. Additional energy strategies employed on campus focus on energy generation and energy storage/distribution. Energy generation features include solar panels on roof planes, solar thermal for hot water and heating, an anaerobic digester to capture compostable waste converting it to methane used to create on-site energy, and wind turbine powered street lights. The captured energy is projected to satisfy 100% of the energy used on site. Excess energy could be stored in a microgrid system and redistributed to the community. Employing this measure would allow DPW to profit from the sale of renewable energy credits from excess production.



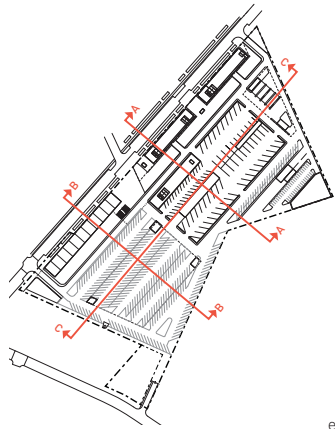
SUSTAINABILITY FEATURES

MASTER PLAN AXON

A - 6 LEVEL PARKING GARAGE	E - FUELING / VEHICLE WASH	I - COMMUNITY PLAZA	M - GREENHOUSES
B - DPW OFFICE BUILDING 1	F - COVERED PARKING - GREEN ROOF	J - SITEWORK	N - PDR / FLEX / COMMERCIAL
C - DPW OFFICE BUILDING 2	G - COVERED PARKING - METAL CANOPY	K - GREEN SPINE	O - COMMUNITY PARK
D - MAINTENANCE FACILITY	H - LINK BETWEEN OFFICES	L - SOLAR PANELS	P - WEST VIRGINIA AVE. STREETSCAPE



STREET SECTION THROUGH WEST VIRGINIA AVENUE



solar thermal energy generation
offset heating, cooling, and energy demands of the campus through solar thermal energy

bioswales, rainwater retention
filters pollutants from stormwater runoff

greywater reuse
recycle waste water on site for reuse in irrigation and toilet flushing

bioswales, rainwater retention
filters pollutants from stormwater runoff

rainwater harvesting
collects rainwater for reuse and mitigates impact on municipal stormwater system

solar photovoltaics
converts sunlight into electricity to power the campus

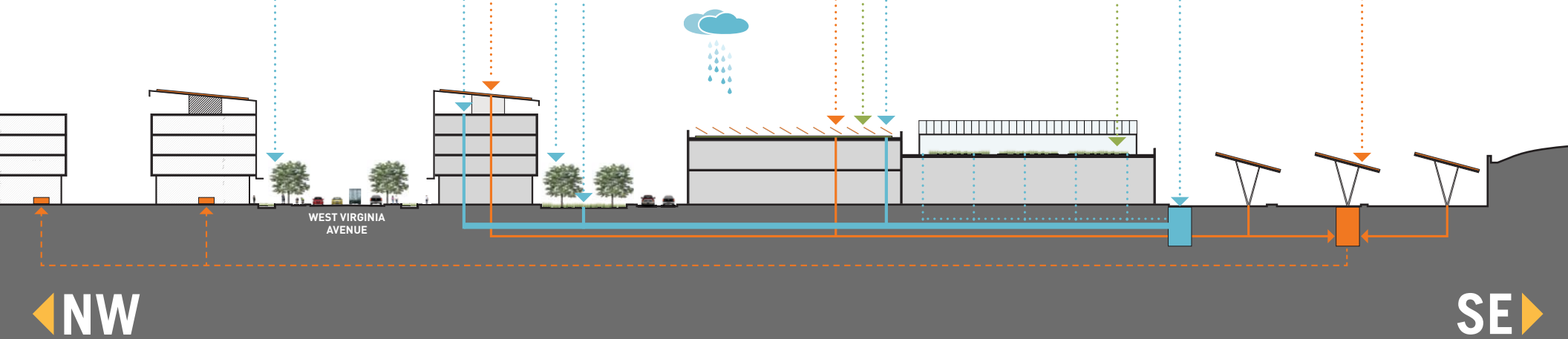
green roof systems
reduces impervious surfaces & solar heat gain

rainwater harvesting
collects rainwater for reuse and mitigates impact on municipal stormwater system

urban agriculture
sustainable & renewable food source and community education

on-site water storage
storage of excess water for reuse

microgrids
energy generation, storage, and demand management within a local network, independent of the central grid.



SITE SECTION - SUSTAINABILITY

- WATER CONSERVATION
- STORMWATER MANAGEMENT
- ENERGY GENERATION
- BIOPHILIC DESIGN



SUSTAINABILITY FEATURES

SOLAR PV PANELS
Reduce solar heat gain and support energy demand



PARK / GREEN ROOF
Reduce impervious surfaces & solar heat gain



WATER COLLECTION & REUSE
Capture on-site rainwater for water reuse & irrigation



GREENHOUSES
Provide renewable food sources & education



BIOSWALES
Filter pollutants from stormwater runoff



BIO-FILTER
Biomass absorbs CO₂ and releases O₂ & passive air filtration



The plan also incorporates goals from the District's Zero Waste Plan, by recommending that compost waste from local schools, shelters, and jails be brought to the site and converted into energy for on-site use. The plan expands on this idea with measures to grow produce on-site in two acres of greenhouses and distribute it back to local schools, shelters, and jails. And it has the potential to be one of the largest productive urban greenhouses in the District.

The net zero water infrastructure and stormwater management plan captures the first 2.2" of runoff on the site. The plan looks at strategies related to the capture, reuse, and treatment of water. Water capture and reuse design features the integration of 100,000 cubic feet of water run-off from the roofs of the greenhouses and the canopies of fueling station into cisterns. The captured water will be used for toilet flushing in the maintenance and office buildings, irrigation of landscapes and urban farm, and vehicle washing. Other stormwater management best practices are bioswales in the green spine and along West Virginia Avenue, green roofs, green walls, pervious paving, and green space to retain and clean runoff. The campus target is to be a 100% pervious site. In addition, on-site black and grey water treatment through a living machine can be experienced in landscape displays inside buildings and outside on the community plaza and green spine. These measures are designed to allow for the campus to operate independently of public infrastructure.

The only way to reduce first costs while incorporating sustainable building strategies is to maximize synergies between building, infrastructure, and environmental systems. The key to maximizing these strategies is to explore optimal design systems and research the life cycle performance compared with the repair and replacement cost overtime. Taken together, the components of the proposed plan promise to make this new DPW campus one of the most sustainable sites in the District. The DPW site as a whole has the potential to be a high-profile model that highlights a comprehensive set of sustainable, net zero energy, and low-impact storm water strategies.

SUSTAINABILITY STRATEGIES POTENTIAL VALUE AND SAVINGS

1 Energy generation

The District has an opportunity to construct a large quantity of photovoltaic cells and generate a significant amount of power on-site. In addition to reducing energy costs, the potential exists to sell excess energy to a microgrid. The City can enter into a Power Purchase Agreement or a lease agreement for a heat and power system with buyout terms. There are numerous mechanisms for third parties to own, operate, and maintain onsite energy generation. Involving a third party is the easiest way for the City to convert future energy-related revenues into up-front capital.



©IBEW-NECA

2 Water infrastructure

Onsite water treatment, retention, and reuse facilities can direct water for use at vehicle wash stations, for watering exterior landscape, and other uses to create a net-zero water facility. In addition, cap-and-trade agreements can be used to leverage onsite permeable surfaces for water run-off.



©SF Public Utilities Commission

3 Urban agriculture and compost digesters

Potential partnership opportunities with other City agencies such as, DC Schools and the DC Department of Corrections could provide great services to District initiatives. Produce grown in the greenhouse on-site can be sold and distributed to local schools and prisons. The compost can be converted into energy as part of the Zero Waste Plan to be used on-site or sold to the microgrid.



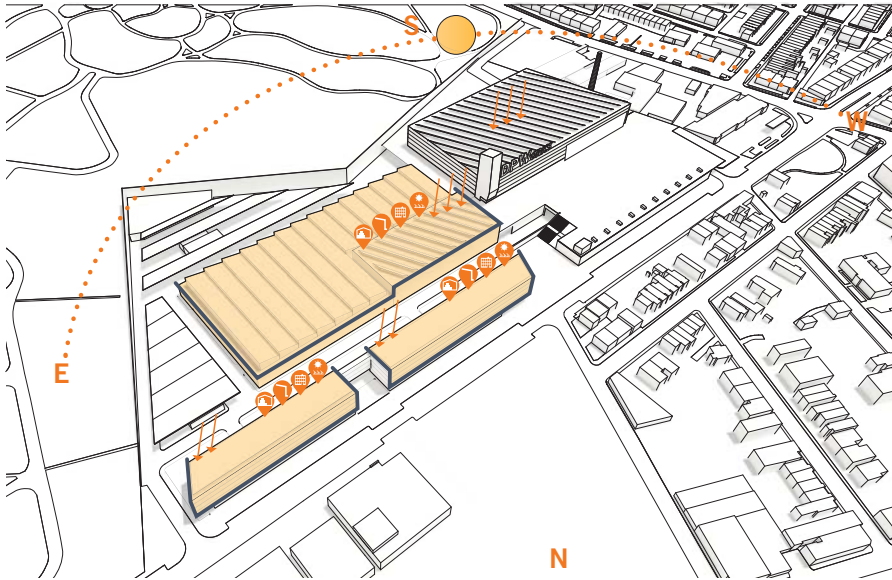
©Fenway Farms

4 Local financial and knowledge resources





The District has a variety of local grants and loans to help finance green infrastructure. There are also a number of City programs that provide training and implementation assistance that can help reduce the DPW operating budget by reducing heating, cooling, fuel, and water-related expenses.

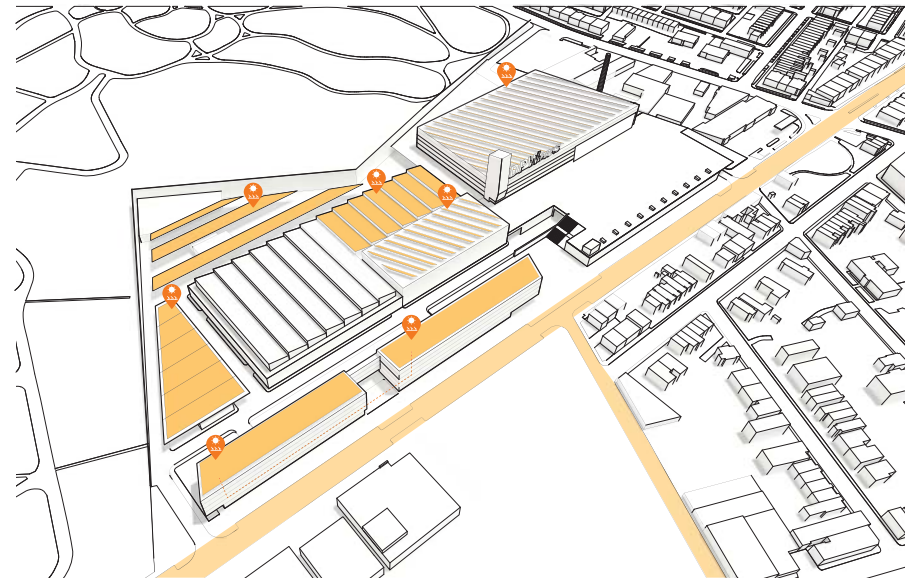


©Murphy Ave Bike Shop






NET ZERO BUILDING

-  **DAYLIGHTING**
Converts sunlight into electricity to power the campus
-  **PASSIVE DESIGN**
Strategies to enhance user comfort and reduce hvac loads
-  **BUILDING ENVELOPE**
Offset hvac loads and energy demands of the campus through solar thermal energy
-  **MATERIALS**
Use of sustainable materials to promote healthy environments and improve indoor air quality



NET ZERO ENERGY AXON

-  **SOLAR PHOTOVOLTAIC**
Converts sunlight into electricity to power the campus
-  **SOLAR THERMAL ENERGY**
Offset hvac loads and energy demands of the campus through solar thermal energy
-  **MICROGRID**
Energy generation, storage, and demand management within a local network, independent of the central grid



BUILDING ENVELOPE AND DAYLIGHTING
©Centre Maintenance Jean Francois



SOLAR ENERGY
©PS Pascal Steel

HIGH PRIORITY NEIGHBORHOOD AMENITIES

The Master Plan incorporates the new DPW campus into its neighborhood by offering community-focused functions that include educational and public space amenities. Ground level spaces in the new DPW office buildings are dynamic, transparent spaces for DPW lobbies, training functions, and PDR commercial flex areas—spaces that allow the agency and community to highlight industrial focused uses in Ivy City and Ward 5.

Directly opposite the Fenwick Street intersection, a new campus gateway serves as DPW's "front door" anchored by a significant pedestrian plaza. This plaza features numerous environmental features, allowing it to act as the symbolic heart of campus and a new open space amenity for the Ivy City community.

At the eastern end of this plaza, a single-story glass and metal panel structure houses an additional 27,000 gross square feet of PDR commercial flex space fronting West Virginia Avenue. Scaled to reflect the lower height of its surroundings, this facility offers significant opportunities for local maker spaces, community retail, entrepreneurial endeavors, and PDR-compatible uses, and provides new job opportunities to the community. Above this structure, a 2-acre community cultural arts park supports passive recreational uses, gatherings, and entertainment for DPW employees and the community. Park features include an art walk with local sculptures and a mural wall, a café, seating, park benches, and a green bio-wall. The park has two public entry points: a wide, monumental stair leading down to the plaza and a landscape ramp that runs parallel to the southern vehicular entry. The alignment of this entry creates points of visual connection to the Crummell School a few blocks north. The park and plaza space is a much needed neighborhood amenity to be enjoyed by DPW employees, local residents, business owners, and the broader community.



©GE Renewable Energy Training

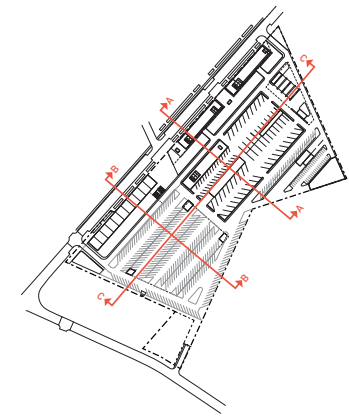


©Southern Alberta Institute of Technology SAIT Parkade





NEIGHBORHOOD AMENITIES


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walkable streets 
 promotes walking, transportation efficiency, and safe comfortable street environments that support public activity

bike lanes 
 promotes alternative means of transportation and supports public activity

community education 
 provides community outreach and learning about sustainable living

flex / pdr / commercial 
 promotes local industry economy and broader community interaction

community park 
 provide open space to promote community activity and healthy living





green wall 
 absorption of CO₂ and release of O₂; passive air filtration to clean the air



NW

SE

SITE SECTION - COMMUNITY

-  COMMUNITY & PLACE
-  COMMUNITY & EQUITY
-  HEALTH & HAPPINESS
-  EDUCATION

REAL ESTATE MARKET CONDITIONS

Over the last couple of years, development has started to occur within Ivy City and Trinidad. Since 2012, over 350,000 square feet of space has been developed within close proximity of the DPW campus site, including 277 residential units, 5,000 square feet of retail space, and a new charter school. An additional 1.3 million square feet of space is currently under construction. These projects include 785 residential units, 200,000 square feet of retail, and 230 hotel rooms, and will reshape the neighborhood. The most impactful near-term real estate project will be the redevelopment of the Hecht Warehouse by Douglas Development Corporation. Located one block from the campus site along New York Avenue, the redevelopment of the historic Hecht Warehouse will include over 300 apartments, 200,000 square feet of retail space, and a 900-space parking garage. A new grocery store, restaurant uses, and neighborhood services such as health and fitness facilities are much-needed amenities for a neighborhood that has remained under-served by retail amenities for decades.

Recent and future development activity will have an important impact on the neighborhood. Currently, the Trinidad and Ivy City neighborhoods are characterized by high poverty rates, low incomes, and some of the most affordable housing in DC west of the Anacostia River. New residential construction will bring households of a different demographic to the neighborhood: predominantly a young professional

demographic. This will likely help precipitate a trend seen throughout the rest of DC: rising neighborhood home values that may make it difficult for some current residents to continue to afford their rent or mortgage. One policy implication may be to leverage the redevelopment of District-owned land to help provide more affordable housing units. While the DPW campus site itself is not a good location for housing, 1431 Okie Street, which will no longer contain DPW uses after the campus redevelopment, will have significant value if rezoned for residential uses. By selling or ground leasing the property to a developer, the District has the ability to mandate that a large portion of new units are affordable.

Furthermore, the monetization of the Okie Street NE site through a disposition may be worth exploring a development feasibility analysis or similar study. At the right price (likely predicated on rezoning to residential), a sale of 1431 Okie Street NE could possibly be leveraged as a significant and non-capital budget source of funding for the DPW Campus redevelopment. 201 Bryant Street NW, which is also currently owned by the city and occupied by DPW uses, will also have a high value if rezoned for residential use and sold to a private developer through the city land disposition process. While this plan recommends that the Bryant Street function not move to West Virginia Avenue, it is possible for them to leave Bryant Street for another northwest location should an opportunity arise. The capital generated could be used to help fund the campus development.



HECHT CO. WAREHOUSE
©Douglas Development Corp and Antunovich Associates

PDR FLEX COMMERCIAL SPACE

Much of the new retail coming to the neighborhood is oriented toward a higher income level. It will be important to help ensure that some shopping and dining opportunities remain affordable to the lower-income households. There will be a small amount of retail space on site and a strong opportunity for these tenants to meet the needs of both DPW workers and neighborhood residents. Because the District owns the DPW site and some adjacent parcels that may potentially be sold, leased, or ground leased, the District has the opportunity to help guide the types of retail tenants on these properties once they are redeveloped. Furthermore, the latest campus site design calls for on-site flex industrial space oriented toward PDR industrial tenants, a land use type that recent local planning initiatives have recommended the District help support in Ward 5. Providing on-site commercial or flex spaces may help support a growing and important industry segment.

PDR businesses require an environment that is pedestrian friendly, strong transportation access, and zoning for industrial use – elements that align well with the DPW campus. Creating a small PDR cluster on site will serve a number of city objectives: grow and create more businesses, particularly in new and emerging industries; provide local residents a range of employment opportunities in well-paid jobs with low entry barriers; address nuisance and operational issues of some existing businesses; and create more connection between the DPW site and its surrounding community.

The value proposition for the city is about creating a vibrant place, supporting an emerging industry segment with particular land use needs, and leveraging the transportation infrastructure of the campus to support businesses with a need for truck distribution. Because the industry users can typically only afford lower rents, cash flows stemming from leases will likely not cover the financial cost of constructing the buildings and fitting out the spaces. Creating a PDR cluster at the edge of the DPW campus will not generate financial value to the city, but it will create value in non-financial ways by serving a variety of District goals.



©Green Point Design Center



©Green Hat Gin



PDR FLEX COMMERCIAL SPACES

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DPW CAMPUS VISION FROM TRINIDAD COMMUNITY



EXISTING CONDITIONS









NEW DPW ADMINISTRATIVE OFFICES AND STREETScape ALONG WEST VIRGINIA AVENUE



EXISTING CONDITIONS

CAMPUS GATEWAY ENTRY PLAZA FROM FENWICK STREET



EXISTING CONDITIONS



DPW WORKS





NEW STREETScape AND GROUND LEVEL ACTIVITY ALONG WEST VIRGINIA AVENUE

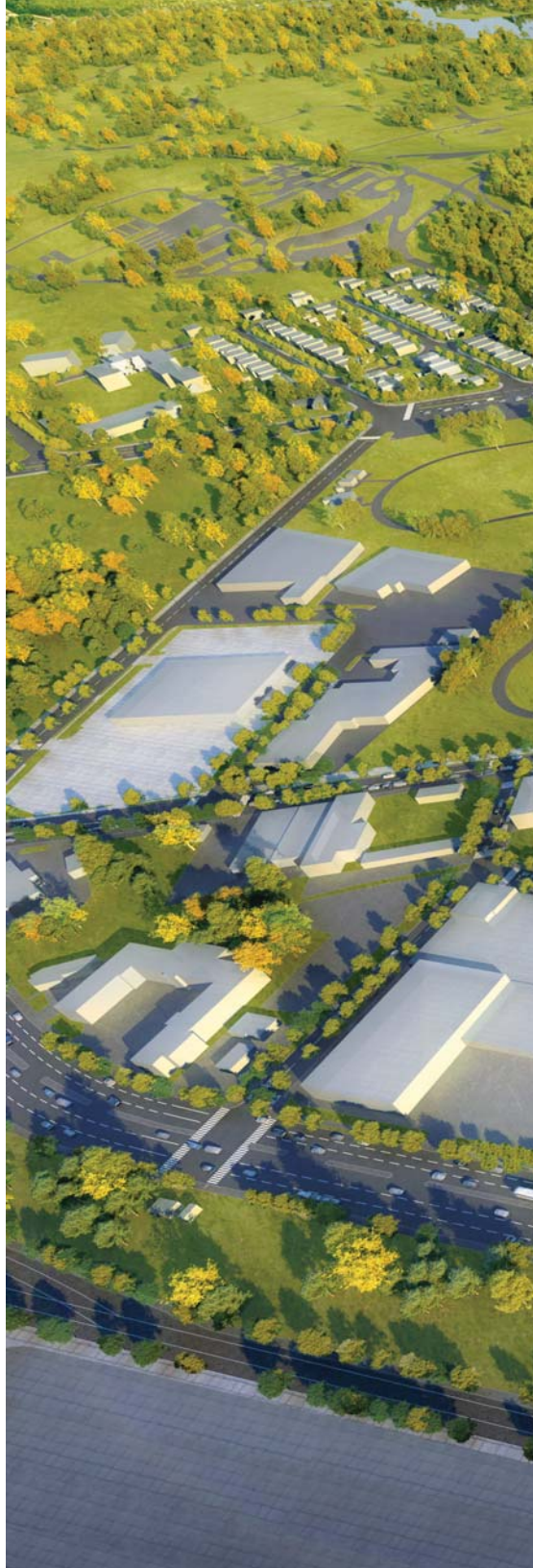


EXISTING CONDITIONS

A COMMUNITY VISION FOR THE NEW DEPARTMENT OF PUBLIC WORKS CAMPUS



EXISTING CONDITIONS





06

IMPLEMENTATION

STRATEGIES

The new DPW campus has been designed to reflect best practices in planning, phasing, and financing strategies that will facilitate viable implementation. This planning study includes recommendations for the programming and design of several new buildings and site improvements. It also outlines construction phasing, financing, and key action items. This final chapter includes a detailed strategy for phasing so that DPW's essential services are never off-line or adversely impacted. Action items are organized into near-term and long-term strategies so work can begin immediately. Creative financing strategies are identified to ensure that ample funding is available to help support new developments. Implementation is a critical component of this Master Plan and both the timing and planning for phasing, construction, and financing are as important as the design in creating a successful new campus.

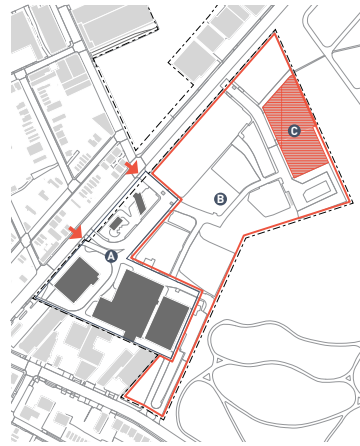


PROJECT PHASING

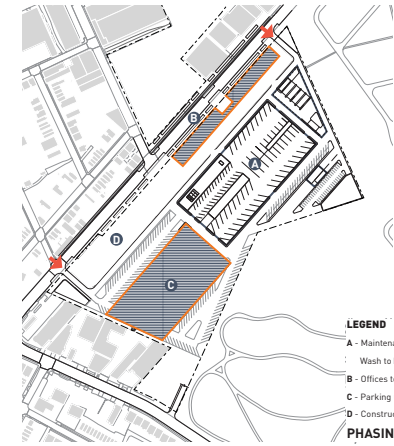
Phasing plays a critical role in shaping the overall Master Plan vision. An environmental analysis is recommended as the first step to determine proper treatment. Current site functions accommodating DPW's central maintenance shop and fueling facilities must remain in continuous operation during construction. Later phases of development can only deploy once the new maintenance and fueling facilities become fully operational.

With this in mind, new fueling and maintenance facilities will be built first to ensure their continuous operation on the site. As the existing fueling and maintenance structures occupy the western half of the site, their replacement facilities will relocate on the eastern half. During the ensuing site construction, this area will operate continuously, supporting DPW fleet fueling, washing and maintenance needs as other parts of the site come on line in future phases.

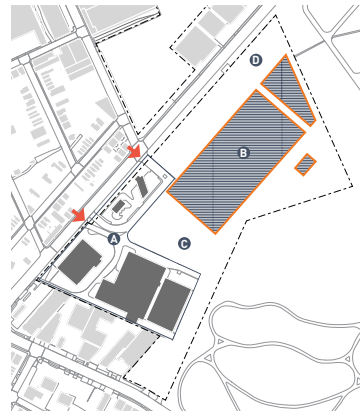
Once the maintenance and fueling facilities are operational and the site demolition is complete, the remaining site will be ready for development. The pre-fabricated concrete construction parking garage will be constructed next followed by the office building employing a poured-in-place concrete construction. The site will develop as a continuous sequence, while the maintenance and fueling facilities remain operational.



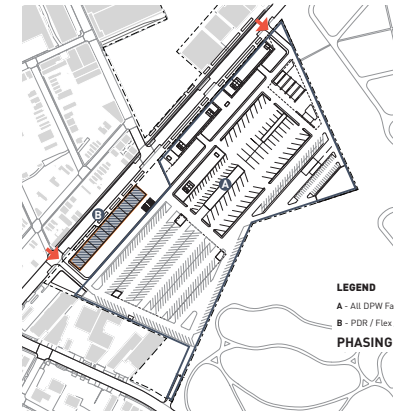
LEGEND
 A - Site and Facilities to Remain Operational
 B - Site Demolition
 C - FMA / Storage Demolition
PHASING _ 0-3 MONTHS



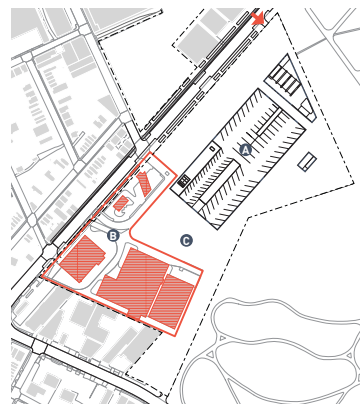
LEGEND
 A - Maintenance Facility, Fueling, & Vehicle Wash to be Operational
 B - Offices to be Constructed
 C - Parking Garage to be Constructed
 D - Construction Staging
PHASING _ 24+ MONTHS



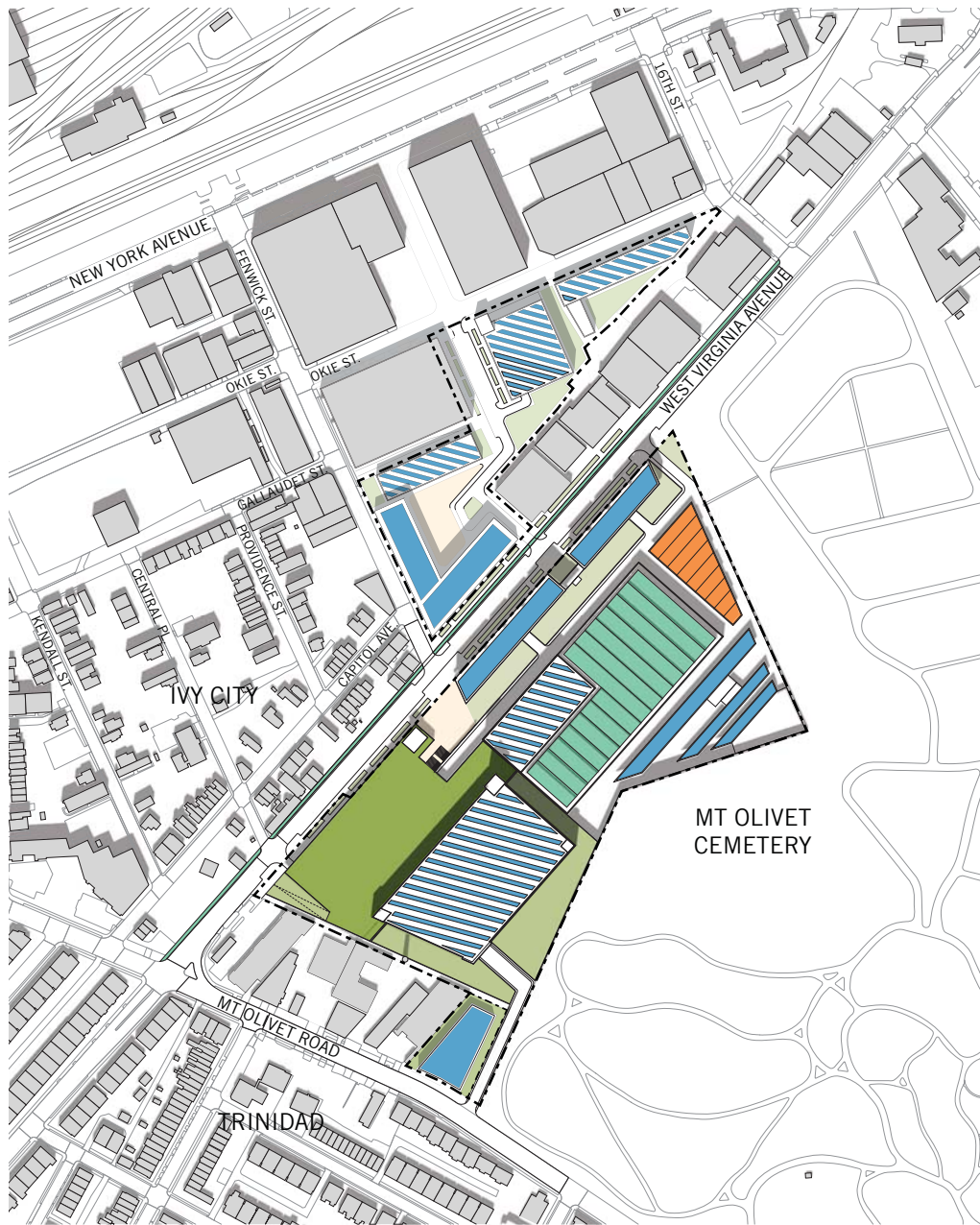
LEGEND
 A - Site and Facilities to Remain Operational
 B - Maintenance Facility, Fueling, & Vehicle Wash to be constructed
 C - Temporary Vehicle Parking
 D - Construction Staging
PHASING _ 3-9 MONTHS



LEGEND
 A - All DPW Facilities Operational
 B - PDR / Flex / Commercial to be Constructed
PHASING _ FULL BUILD



LEGEND
 A - Maintenance Facility, Fueling, & Vehicle Wash to be Operational
 B - Existing Facilities and Site Demolition
 C - Temporary Vehicle Parking
PHASING _ 9-12 MONTHS



A FULL HUB DEVELOPMENT VISION ON WEST VIRGINIA AVENUE NORTH AND SOUTH SITES

THE FULL HUB DEVELOPMENT

The full vision for the master plan, which leverages the adjoining parcel on Mt. Olivet Road and the District-owned West Virginia Avenue north site, aims to provide a mix of building uses that reflect the character of the Ivy City neighborhood and build upon the framework in the West Virginia Avenue Master Plan.

There are several new developments along New York Avenue and many in the planning stages, most of which are redevelopments of old industrial buildings into new residential and mixed-use programs. The Ivy City neighborhood is undergoing a lot of changes and through this study, design guidelines will be recommended for the West Virginia Avenue north site that adhere to the design principles set forth on the West Virginia Avenue south site. This aims to guide future development with design and development ideas shaped by the community.

Adhering to the same urban design principles of the Master Plan, a strong focus should be placed on uses that connect to the Ivy City community. Any development should make use of enhanced green spaces, promote variation of building frontages with continuous massing, maximize viability of ground floor spaces, promote cohesive building forms and design, and achieve high quality design excellence.

The full master plan vision will also employ a range of innovative sustainable design strategies and high-performance building standards to encourage healthy living, energy efficiency, and stormwater management.

CAMPUS COST

Based on funding considerations, financing opportunities, community and urban design impact, and DPW operating budget implications, it is strongly recommended that “Enhanced Sustainability Investments” and “High Priority Neighborhood Amenities” be included within the campus plan. These investments will also open up the campus to additional sources of finance and additional potential implementation partners. Through a range of partnership and funding strategies, it is estimated that the general fund cost towards campus construction can be reduced from \$336 million to \$202.9 million. There are a wide range of sustainability investments, programs, and partnerships that are applicable to the campus redevelopment and could provide additional capital to help fund campus construction and DPW operations, in addition to delivering environmental benefits for years to come. The following pages outline these strategies.

FUNDING AND PARTNERSHIP RECOMMENDATIONS

The following charts summarize a variety of potential partnership structures and funding mechanisms that can help reduce capital budget expenditures. Broken into separate charts for each design scenario, these tables are intended to serve as a guide to help City decision-making as it pertains to financing campus construction. In addition to cost implications, different funding or partnership strategies have varying impacts on financing, meeting community goals, urban design considerations, and on DPW operations. The recommended priority of each strategy is based on the collective impact it has on reducing capital fund expenditure, impact on DPW operations, and impact on achieving community, sustainability, and design goals.

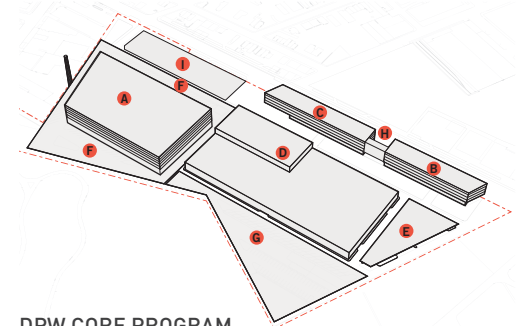
Campus Land Use	Land Use (SF)	Construction Cost
DPW Core Program		
• DPW Facilities Including Parking	213,000 sf	\$111,799,700
• Office	124,000 sf	\$47,217,200
• PDR / Flex / Commercial	9,000 sf	(Incl. above)
• Sitework	n/a	<u>\$22,275,200</u>
• TOTAL	346,000 sf	\$181,292,100

Enhanced Sustainability Investments		
• Solar Panels	300,000 sf	\$13,929,500
• “Green Spine” Greenspace Buffer	45,000 sf	\$1,125,000
• Greenhouses	<u>165,000 sf</u>	<u>\$19,030,000</u>
• TOTAL	510,000 sf	\$34,084,500

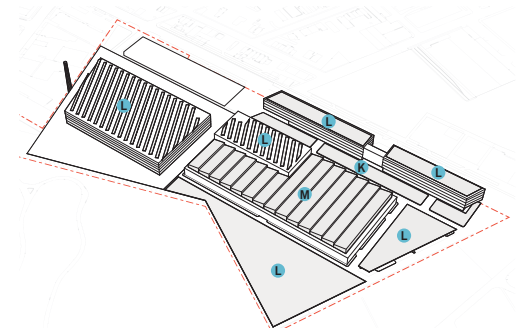
High Priority Neighborhood Amenities		
• PDR / Flex / Commercial	27,500 sf	\$12,502,400
• West Virginia Ave Streetscape	110,000 sf	\$5,100,000
• Community Park	<u>136,000 sf</u>	<u>\$8,858,600</u>
• TOTAL	273,500 sf	\$26,461,000

Total Direct Costs	\$241,837,600
Fees, Contingencies, and Insurance	\$94,401,000
Campus as Community Hub Total Cost	\$336,238,600

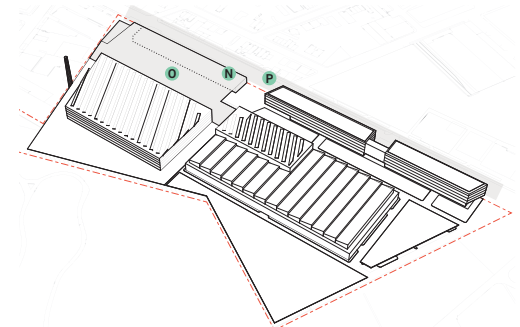
Note: See TCT Cost Consultants report dated 11/11/2015 for full line-item costs. Above costs do not include soft costs nor environmental remediation costs.



DPW CORE PROGRAM



ENHANCED SUSTAINABILITY INVESTMENTS



HIGH PRIORITY NEIGHBORHOOD AMENITIES

Methods for Reducing General Fund Expenditure: Specific to the DPW Core Program

	Funding or Partnership Strategy	Up-Front Revenue Generated or Costs Saved ¹	Cumulative General Fund Expenditure ²	Estimated Impact on Project Financing ³	Estimated Impact on Community	Estimated Impact on Urban Design	Estimated Impact on DPW Operations	Overall Recommendations
1	No private involvement (retain all land)	None	\$336,200,000	n/a	n/a	n/a	n/a	The City should utilize a variety of funding strategies (below) to reduce capital budget expenditure
2	Partnerships for space needs during construction: - Lease nearby staff parking - Lease staff office space at Okie or Reeves - Fleet parking on W. St. site	None (Baseline campus cost estimates assume that the strategies to the left are undertaken, thereby preventing the need to build a structured garage and reducing const. costs considerably)	\$336,200,000	No significant impact	Eliminates eyesore of additional parking garage	Eliminates eyesore of additional parking garage	Lease costs for offsite parking and office use during constr.; no long-term cost impact	Large vacant lots in Ward 5 present an opportunity to sign a temporary parking agreement; move staff to office space on Okie site or to Reeves Center; park fleet at W Street site and shuttle drivers
3	Sale of the Okie Street site	\$17,900,000	\$318,300,000	Favorably impacts City debt ratio	Opportunity to guide redevelopment to serve the community; potential for affordable units	Site redevelopment will enhance density, vibrancy, & walkability	Loss of long-term land asset	DMPED disposition to guide site use and design restrictions; existing DPW uses moved to campus; rezoned to residential
4	Sale of Bryant Street site	\$29,500,000	\$288,800,000	Favorably impacts City debt ratio	Removes undesirable DPW truck traffic from residential area; potential for afford. units	No significant impact	Cost of changing locations; rent paid to store trucks at new facility loss of asset	DMPED disposition; move DPW uses to new facility in NW; consider partnership with Howard U. or Wash. Hospital Ctr.; rezoned to residential
5	Ground lease Mt. Olivet Road portion of campus site	\$1,700,000	\$287,100,000	No significant impact	Helps bring commercial land uses to Mt. Olivet	May help bring additional density and vibrancy	No significant impact	DMPED ground lease including site use and design restrictions
6	Developer-funded office buildings along West Virginia	\$47,200,000	\$239,900,000	Favorably impacts City debt ratio	Helps bring commercial land uses to West Virginia Ave	Enables desired density and site design	Office rent will raise operating budget	Ground lease West Virginia Ave portion of campus via build-to-suite design; DPW lease-back of space

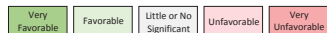
Methods for Reducing General Fund Expenditure: Specific to Enhanced Sustainability Investments

7	On-site energy generation/sales (photovoltaic power purchase agreement)	\$13,900,000 ⁷ (Assumes solar panel construct. cost funded by PPA revenue)	\$226,000,000	Favorably impacts City debt ratio	No significant impact	No significant impact	Energy revenues / savings ⁷	Convert future energy sales or savings to capital via PPA to help finance PV panels or other green infrastructure.; consider developing/ selling to a microgrid
8	Partner with DC Water to build sustainable onsite water infrastructure	\$1,100,000 ⁷ (Assumes green spine funded within DC Water cap. projects budget)	\$224,900,000	No significant impact	No significant impact	No significant impact	City savings on water costs ⁷	Build onsite water collection, treatment, and re-use infrastructure. via DC Water funds, including green spine
9	Build onsite compost digester, convert green-house waste to energy, sell to microgrid	\$9,500,000 ⁷ (Assumes half of greenhouse constr. cost to be funded by partners)	\$215,400,000	Favorably impacts City debt ratio	No significant impact	No significant impact	Potential revenues from energy sales ⁷	Consider partnership with DC Schools and Dept. of Corrections to produce food on site for school/prison consumption
10	Incorporation of available energy or sustainability grants, loans, & other programs	Requires further analysis ⁷	\$215,400,000	Requires further analysis	No significant impact	No significant impact	Energy savings; green infra. loan assist. ⁷	Work with DOE to help reduce infrastructure, development costs and reduce annual energy expenses

Methods for Reducing General Fund Expenditure: Specific to High Priority Neighborhood Amenities

11	Fund park with DC DPR funds or other sources	None (DPR general fund allocation for park construction)	\$215,400,000	No significant. impact (still City funded)	Will provide a new park	Brings public greenspace to site	None: DPR should operate park	Fund park constr. via DPR capital projects budget; DPR should operate the park
12	Fund WV Ave streetscape improve. with DDOT funds or other sources	None (DDOT general fund allocation for streetscape improvements)	\$215,400,000	No significant. impact (still City funded)	Will provide streetscape improve.	Helps site connectivity and street frontage	None: DDOT should maintain streetscape	It is recommended that DDOT fund the needed streetscape improvements
13	Secure outside philanthropic, grant, or private funding for PDR facilities or build at a future date	\$12,500,000 (Assumes PDR facilities are constructed at a later point in time)	\$202,900,000	No significant. impact (still City funded)	Will provide new PDR space	Enhances onsite activity	None: DGS should manage PDR space	Private developer and/ or PDR business may be willing to partner to help reduce constr. cost to City; consider delaying PDR constr. if funds are not available

LEVEL OF IMPACT



Original estimated general fund expenditure for campus development: \$336.2 million
 Approximate cost reduction to the general fund if the above funding strategies are implemented: - \$133.3 million
Estimated DPW/DGS general fund expenditure if the above funding strategies are implemented: = \$202.9 million⁶

CONNECTIVITY AND TRANSIT

RECOMMENDATIONS

- 3.01 Expand access to transit at the West Virginia Avenue site by:
- Sponsoring a connector shuttle to the Metrorail
 - Providing real-time transportation information displays in lobbies, employee lounges, and other common spaces
 - Offering transit benefits to DPW employees such as pre-tax transportation accounts
 - Improving or constructing bus shelters and other transit amenities
- 3.02 Enhance bicycle connections and services by:
- Providing a range of bicycle and active transportation accommodations including covered and secure bicycle parking for employees in the parking structure or within the proposed office buildings
 - Creating a bike lane along West Virginia Avenue to improve bicycle connectivity in the area. Interim design strategies such as epoxied gravel, planter beds, and bollards can be used in advance of full reconstruction
 - Accommodating shower, changing, and locker room facilities for employee use
 - Locating bicycle racks adjacent to sidewalks for public use when patronizing the campus or the storefront occupants
 - Exploring private bicycle share opportunities where DPW can provide a bicycle fleet to employees, ensuring readily available bicycles for staff
- 3.03 Increase information about transportation services and benefits by using DDOT's GoDCgo resource, which helps employers craft and implement unique transportation demand management programs that meet their employee needs. GoDCgo staff can provide information at transportation fairs, help plan and promote participation in alternate commute events such as Car Free Day and Bike to Work Day, and develop employee and employer recognition programs.

CIRCULATION AND ACCESS

RECOMMENDATIONS

- 3.04 Create an "internal spine" that provides a hierarchy of circulation and service core to:
- Clearly connect internal operations and circulation with the campus
 - Distribute vehicles on site to internal parking and facilities
 - Provide loading/service access for the office buildings along the "internal spine" to preserve the streetscape along West Virginia Avenue
 - Organize site elements such as the fueling station and maintenance facility interior to the site in order to promote pedestrian friendly uses along West Virginia Avenue
- 3.05 Design clear internal site circulation to prevent operational and deployment conflicts by:
- Ensuring internal intersections are at right-angles where possible for most efficient sight
 - Establishing clear vehicular circulation through the site, avoiding heavy vehicle deployment conflicts
 - Integrating appropriate signage for wayfinding and marketing in and around the site
- 3.06 Increase information about transportation services and benefits by using DDOT's GoDCgo resource, which helps establish clear entries to the site, differentiating public and private access points and protecting the neighborhood from the increased number of fleet vehicles by:
- Constructing two access points for heavy vehicles that have designated gate controls, security, and queuing. Continue to analyze the need for signaled intersections at these access points in later phases of this project
 - Creating a clear access point on Mt. Olivet for light fleet vehicles with designated gate controls, security, and queuing. Continue to analyze the need for a signaled intersection at these access points in later phases of this project
 - Designating clear truck routes along commercial streets to and from the site in order to minimize the impact on the residential community

SAFETY AND SECURITY / PARKING

RECOMMENDATIONS

- 3.07 Improve pedestrian safety and walkability in and around the site by:
- Increasing activity on and observation of the street and preserving direct sight lines for pedestrians, bicyclists, and drivers
 - Improving lighting in and around the site
 - Designing a continuous street wall along West Virginia Avenue with diverse, well-intentioned landscaping
 - Painting clearly marked pedestrian street crossings
 - Limiting the number of curb cuts on West Virginia Avenue to improve pedestrian safety and circulation
 - Maintaining on-street parking as a buffer between vehicular travel lanes and pedestrians
 - Installing traffic calming measures such as curb extensions and painted crosswalks along West Virginia Avenue
- 3.08 Provide incentives and support for carpooling and ride sharing by:
- Reserving preferred spaces for registered carpool vehicles and pools
 - Providing ride matching assistance such as Zimride or Ride Amigos for employees to find other carpoolers
 - Designating convenient drop off locations to accommodate employees who ride share with non-DPW staff
 - Collaborating with DDOT and car share providers (Zipcar, Enterprise CarShare, car2go) to encouraging enrollment in car sharing
- 3.09 Manage allocation of parking by:
- Staggering morning shifts so that staff arriving early can check out their assigned fleet vehicle, leaving room for staff arriving later to park their personal vehicles prior to checking out their assigned fleet vehicle. Flex spaces would remain and as staff return from their field assignments, park the fleet vehicle, and leave with their personal vehicle, freeing a space available for the next wave of returning fleet operators
 - Initiating a parking permit system that provides preferential parking to staff arriving when transit services are not readily available, departing in late evening hours when safety is of heightened concern, or have special needs
- 3.10 Accommodate all DPW parking needs on site to avoid adding parking demand to the surrounding community by:
- Providing shared parking opportunities such as using fleet spaces as “flex spaces” for DPW employees to reduce overall parking demand on site
 - Maintaining all street parking for residence and businesses in the area

UTILITIES / ENVIRONMENTAL REMEDIATION / LANDSCAPE

RECOMMENDATIONS

- 3.11 Design and implement a cohesive utility network to properly serve the site by:
- Replacing the existing wet and dry utility services (water, sewer, storm, gas, electric, communication) with new services, separating sewer and storm systems (no combined sewer system)
 - Replacing the overhead electric and communications lines on West Virginia Avenue with underground lines
- 3.12 Address existing environmental contamination on site by:
- Conducting a thorough environmental analysis in the next phase of this project
 - Providing soil remediation options for contaminated soils
- 3.13 Integrate landscape elements with the overall site design by:
- Maintaining the existing stand of trees that separate Mt Olivet Cemetery and the site
 - Creating a landscape screen between the office and industrial portions of the campus
 - Providing street scape improvements on both sides of West Virginia Avenue
 - Designating areas for biomass to filter the air and reduce the site’s carbon footprint
- 3.14 Limit grading and soil removal from the site by:
- Raising the grade from West Virginia Avenue to the buildings
 - Retaining a positive slope from the south side to the north side of site, eliminating any low spots
 - Maintaining the existing grading in south-east portion of site in as much as possible
 - Limiting the height of the wall between Mt Olivet Cemetery and the site

WATER / ENERGY

RECOMMENDATIONS

- 3.15 Achieve net zero stormwater management runoff (the 100 Percentile Storm) by retaining the first 2.2" (137,231 cf) of runoff on the site by:
- Integrating 100,000 cf of cistern on site for toilet flushing in the maintenance and office buildings, irrigation of the greenhouses, vehicular washing, and the HVAC cooling tower.
 - Utilizing bio-retention techniques in green areas on site and incorporating bioswales into streetscape and open space design
 - Constructing green roofs wherever possible to retain rainwater and contribute to site-wide stormwater management practices
 - Designing the site to be 100% pervious
- 3.16 Treat contaminated runoff and blackwater on site by:
- Using an anaerobic digester to breakdown organic material and supply the site with compost and energy
 - Exploring the potential for a black water filter system (Living Machine) for the Green Spine in later phases of the project
- 3.17 Utilize a variety of sustainable energy generation methods to create a net zero DPW campus by:
- Installing solar panels on the majority of rooftop surfaces
 - Installing solar thermal panels to meet hot water requirements
 - Installing solar or wind powered street lighting throughout the campus
 - Installing Ground Source Heat Pumps to provide building heating and cooling requirements
 - Integrating an anaerobic digester on site to capture waste, ultimately converting it to methane which can be used to create energy for the site and capturing biogas that could serve a combined heat and power (CHP) system or biogas full cell
- 3.18 Utilize any net positive energy from the DPW campus to serve the larger community by:
- Developing a microgrid for the DPW campus to store excess energy and redistribute it to other locations. Off-peak hours allow opportunities for energy to be stored and redistributed to the community
 - Selling renewable energy credits for excess energy produced on site

URBAN AGRICULTURE / GREEN DESIGN BENEFITS / BUILDING DESIGN

RECOMMENDATIONS

- 3.19 Capitalize on the benefits of urban agriculture and use food production opportunities to produce food for local schools, jails, and shelters in the community by:
- Constructing two acres of greenhouses on the roof of the maintenance facility to grow produce and use the graywater and digested soils generated on site.
 - Using on-site agriculture to reuse compost waste from the anaerobic digester
 - Tying urban agriculture efforts into the DC Food movement and nearby Unions Market area
- 3.20 Capitalize on all components and phases of sustainable design integration by::
- Employing local residents and creating jobs for the construction and implementation of green energies on site
 - Providing training for residents about sustainable energy technologies and practices
 - Designing healthier systems to ensure a better environment for employees and the surrounding community
 - Using the DPW campus to brand the neighborhood of Ivy City as the next EcoDistrict
- 3.21 Pursue aggressive building energy reduction strategies including the principles of passive design and high efficiency fixtures that minimize the energy use intensity and promote a healthy environment by:
- Integrating cutting-edge building technologies and sustainable design practices for buildings on site
 - Capitalizing on natural daylighting with narrow office buildings
 - Using low VOC products in all buildings
- 3.22 Develop a waste management plan for operation of the site with a net zero goal
- Reuse all campus generated organic waster for landscape compost waste
- 3.23 Provide programming that addresses DPW needs, while contributing to the local community needs:
- Gym
 - Café
 - Library
 - Training facilities
 - Park space

FUELING / OPERATIONS

RECOMMENDATIONS

- 3.24 Continue to develop DPW's green fleet vehicles to improve air quality at the site, in the neighboring community, and throughout the District by:
- Expanding DPW's electric fleet vehicle inventory
 - Increasing DPW's use of CNG and other alternative fuels
 - Providing access for other District operations to utilize the alternative fuels provided by DPW at the fueling station on site
- 3.25 Improve and enhance DPW operations by:
- Designing the campus to facilitate employee an vehicle deployment
 - Accommodating necessary adjacencies between divisions through the integration of all units into the office buildings and establishment of a "hub" space above the maintenance facility
 - Slightly staggering shift times in the morning to avoid deployment conflicts
 - Providing much needed amenities such as recreational areas, a library, and lounge space for DPW employees to improve their work environment and quality of life
 - Using DGS's Workplace Design Guidelines to generate modern, efficient office configurations that improve DPW's work environment
 - Encouraging the use of shared spaces such as reception areas, conference rooms, kitchens/break rooms, workrooms, and storage both within and across divisions

VEHICLES

RECOMMENDATIONS

- 3.26 Strategically plan for fleet vehicles to improve vehicle lifespan and reduce overall parking costs for the site by:
- Locating all heavy fleet vehicle parking at grade in order to reduce structural demands on the parking structure
 - Locating light fleet and personal vehicles on the upper levels of the parking garage and providing access to the garage from Mt. Olivet in order to distribute traffic and not concentrate it at West Virginia Avenue.
- 3.27 Reduce fleet age by renewing fleet (i.e., reducing the average age of the vehicles and equipment). This will reduce the overall maintenance and repair costs to the organization since older vehicles require more maintenance and repair
- 3.28 Increase FleetShare program in order to reduce the number of permanently assigned vehicles, encouraging the sharing of DPW vehicles across divisions. In the near term, this requires the acquisition of more vehicles, but the hope is that an increased FleetShare can improve the rate of use of vehicles and can ultimately reduce the number of vehicles needed. Downsizing the fleet would result in immediate revenue from the sale of disposed assets, a lower total cost of ownership for the fleet, and reduced future capital replacement dollars.
- 3.29 Increase technician productivity by improving shop management and establishing performance objectives for the technicians. This will improve shop operations (i.e., improve repair turn-around times) and likely reduce some of the overtime effort.
- 3.30 Improve preventive maintenance compliance to better the overall maintenance of the fleet and increase vehicle lifespan
- 3.31 Reduce stock inventory in the parts operation by returning unused/no longer needed parts and supplies to the vendor for future credit or disposing of obsolete parts through normal disposal programs (i.e., on-line auctions). This would provide a source of revenue for DPW, either real or in the form of vendor credits.
- 3.32 Revise the fleet inspector's program to review safety sensitive repairs (i.e., steering, brakes, etc.) on a regular basis and perform random quality assurance checks, and performance based inspections for new hires or when issues with technician competency arise. Eliminating inspections on nearly 100 percent of the work would likely reduce the time it takes to put the units back into service and could possibly reduce the number of inspectors required to perform this service.
- 3.33 Develop/improve satellite fleet maintenance and repair operations at Bryant Street and W Street. Small maintenance operations at these satellite locations improve accessibility of the shop, reduce travel time, and increase crew productivity, resulting in improved overall service levels to the residents and visitors of the District.

07

PROJECT ACKNOWLEDGMENTS

CORE DISTRICT TEAM:

- Department of Public Works (DPW)
- Office of Planning (DCOP)
- Department of General Services (DGS)

KEY CONTRIBUTING AGENCIES

- Department of Energy & Environment (DOEE)
- Office of the Deputy Mayor for Planning and Economic Development (DMPED)
- District Department of Transportation (DDOT)
- DC Water

CONSULTANT TEAM

- Ayers Saint Gross – Lead Designer / Master Planner
- ARUP – Environmental Engineer
- Gorove Slade – Transportation Engineer
- Mercury – Fleet Management
- Mosaic Urban Partners – Market and Financial Advisor
- Nelson Nygaard – Transportation Demand Management
- Reingold LINK – Community Engagement
- TCT – Cost Estimator
- Wiles Mensch – Civil Engineering

