

PRODUCTION, DISTRIBUTION, REPAIR LAND USE REPORT

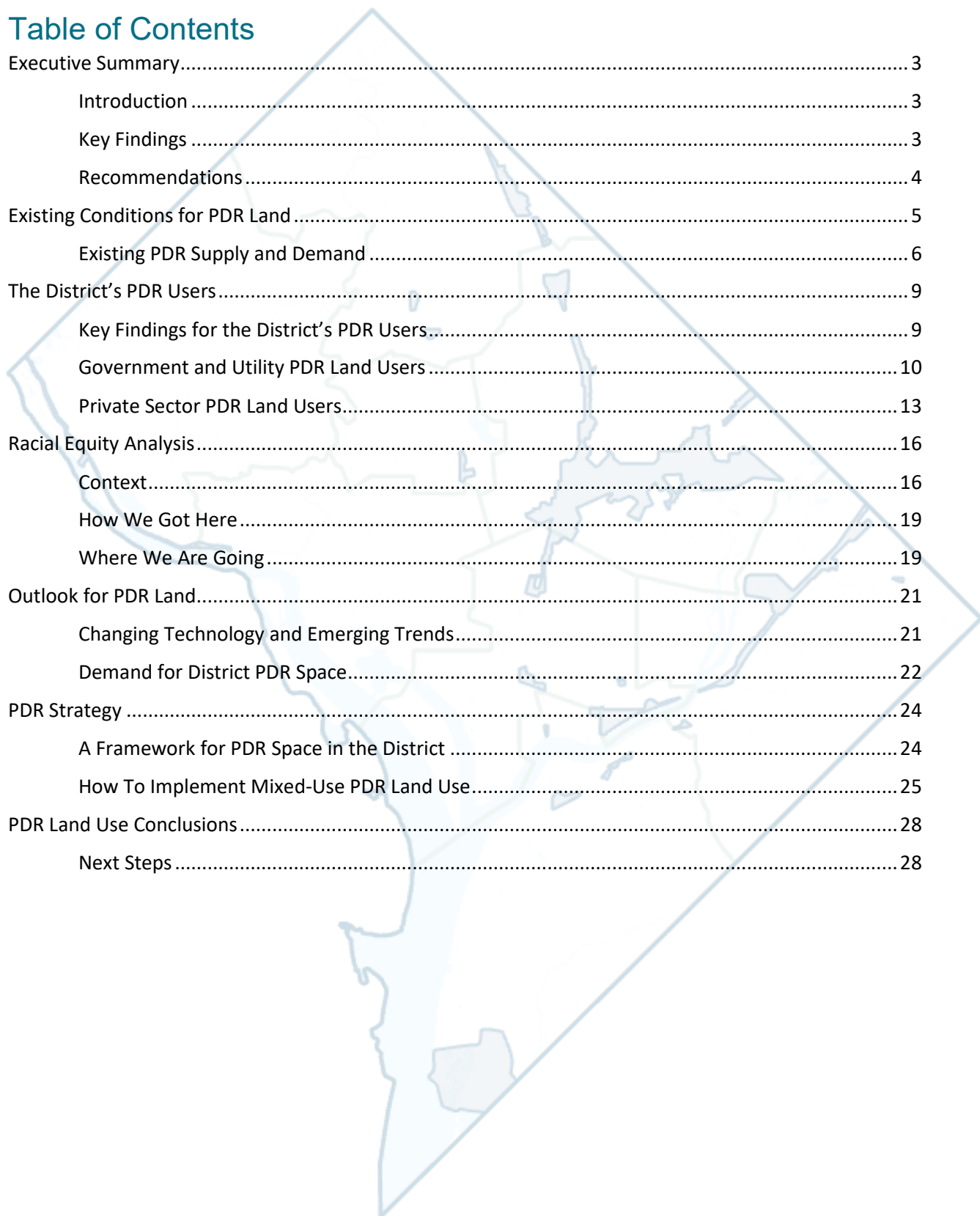


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District of Columbia
Office of Planning



Table of Contents



Executive Summary.....	3
Introduction	3
Key Findings	3
Recommendations.....	4
Existing Conditions for PDR Land	5
Existing PDR Supply and Demand	6
The District’s PDR Users.....	9
Key Findings for the District’s PDR Users.....	9
Government and Utility PDR Land Users	10
Private Sector PDR Land Users.....	13
Racial Equity Analysis.....	16
Context.....	16
How We Got Here.....	19
Where We Are Going.....	19
Outlook for PDR Land.....	21
Changing Technology and Emerging Trends.....	21
Demand for District PDR Space.....	22
PDR Strategy	24
A Framework for PDR Space in the District	24
How To Implement Mixed-Use PDR Land Use.....	25
PDR Land Use Conclusions.....	28
Next Steps	28

Executive Summary

The DC Office of Planning (OP) prepared this report on Production, Distribution, and Repair (PDR) land use in the District of Columbia to implement Comprehensive Plan Action LU-3.2.F: PDR Land Use Retention Study. This report will inform the Comprehensive Plan rewrite, which is scheduled to start in 2025. The findings from this report will also inform the Zoning Commission (ZC) when it considers amendments to PDR zoning or to PDR zoned lands.

Introduction

PDR land is used to provide critical services to District residents and businesses including trash pick-up, wastewater treatment, and roadway repair. PDR land is also critical for the operation of businesses, such as construction companies that do business with the District, companies that make or warehouse food and other consumer products, companies that repair cars, and businesses that deliver goods to residents.

Today, PDR land for these critical services is highly-utilized and it is important to maintain them in years to come. The District has reached a critical decision point to update its PDR land use policy. There is an opportunity to achieve mutual benefits to the District's economy and residents.

This report addresses three important PDR questions:

1. How much PDR land does the District need?
2. What strategies can the District use to meet its PDR needs?
3. How can the District safely and equitably implement mixed-use PDR land use?

To answer these questions, OP analyzed PDR uses within the District and the surrounding region to learn where they are located, how they are designed, and how they function.

Key Findings

- **The District has a small, but well used share of the region's PDR space:** PDR land represents 5.2% of the District's land area and about 4% of the metropolitan region's 195.7 million square feet of PDR space. The vacancy rate for PDR buildings in the District is at a historic low of 4.2% and these buildings are generally in good condition. The vast majority of District PDR buildings are in use and can operate successfully for years to come.
- **Government and utility providers are major users of PDR land in the District.** The Washington Metropolitan Area Transit Authority

The language used to describe PDR can be complicated. **PDR land**, **PDR uses**, and **PDR space** are three key terms in this report. OP defines these terms as:

- **PDR land** – areas in the District that can be used by production, distribution, and repair businesses. Most PDR land is designated by both zoning and future land use policy in the Comprehensive Plan. Some PDR land is only designated by zoning, which means it could be converted to a different use in the future.
- **PDR uses** – activities typically permitted only on PDR zoned land as a principal use. These uses include construction businesses, alcohol distribution, auto repair and maintenance, breweries and distilleries, warehousing, and distribution centers.
- **PDR space** – buildings or portions of buildings, typically on PDR zoned land where PDR uses take place.

(WMATA), Pepco, DC Water, the federal government, and District agencies provide a wide range of essential services that require PDR land. Currently, government and utility facilities use 62% of the PDR land. These agencies and utilities operate heavy vehicle fleets (such as snowplows and garbage trucks), water treatment facilities, and critical transit infrastructure (such as rail yards and bus garages). Another 4% is non-buildable land that includes roadways, sidewalks, alleyways, and other rights-of-way. Demand for these essential services is increasing in the District and current facilities will need to be used more intensively in the future. Some government and utility facilities, may be able to operate in zones other than PDR. This alleviates some of the pressure to locate all PDR-related uses on PDR zoned land and allows for services to be closer to the people and places they serve.

- **Commercial PDR uses are valuable to the District’s economy.** A wide range of businesses use the District’s PDR space including construction companies, alcohol manufacturers and distributors, cannabis growers and processors, food manufacturers, and logistics companies. These businesses provide services to District residents and businesses. They also provide entrepreneurship and employment opportunities for residents. The District should retain 30% of PDR land for commercial use, many of these businesses can be located in mixed-use buildings.
- **PDR uses impact quality of life for residents living nearby.** Most PDR land is located near highways and railroads, which is where most emissions that cause poor air quality are generated. People who live nearby the District’s PDR land are predominately Black and typically have lower incomes than the District’s average.¹ They are also more likely to have shorter life expectancy and higher rates of chronic illnesses including heart disease, cancer, and asthma. Many of the District’s fleet vehicles and heavy equipment will transition to electric over the next decade, dramatically decreasing their emissions. However, depending on the PDR use, some facilities may continue to have emissions and impacts that can affect nearby residents’ health and quality of life. The District Department of Energy and Environment (DOEE) and the US Environmental Protection Agency (EPA) are monitoring air quality to assess the impacts of several of these facilities.

Recommendations

Based on these findings, this report makes four recommendations:

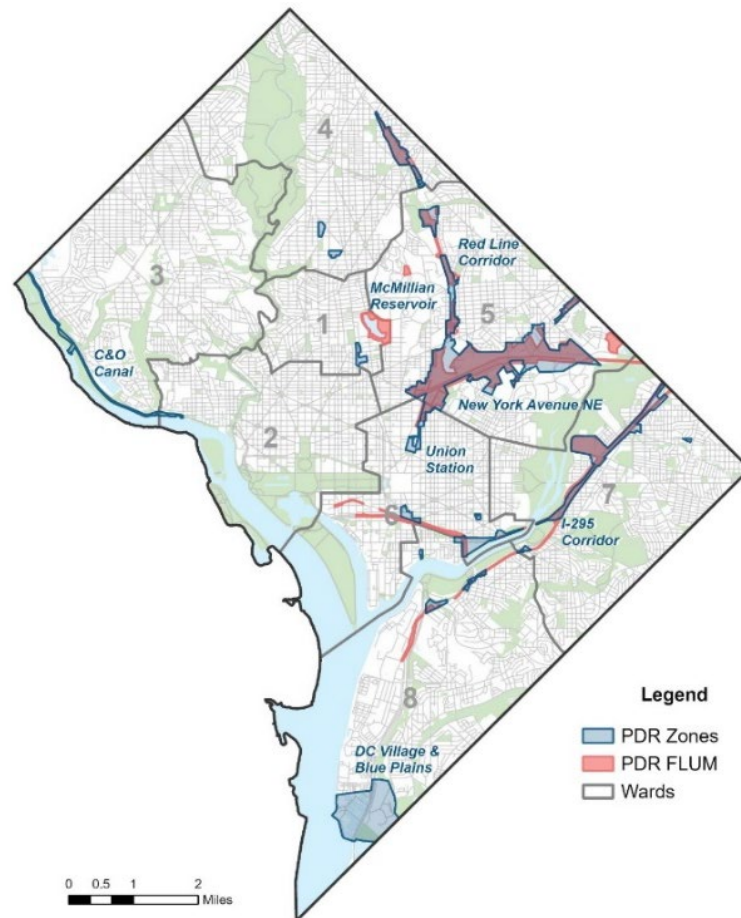
1. **Adopt a PDR retention policy in the Comprehensive Plan rewrite** to secure enough PDR space for essential operations and important businesses. The District should retain 70% of existing PDR land for exclusive PDR use to meet the needs of the government and utilities.
2. **Establish new mixed-use PDR zoning designations that allow residential uses** alongside low-impact PDR uses.
3. **Update zoning that is used to implement the Comprehensive Plan’s future land use policy for commercial and local public facilities uses.** Consider allowing lower impact PDR uses within other mixed-use zones to improve service for residents and decrease demand on limited PDR land.
4. **Identify and pursue co-location opportunities for DC government PDR facilities** to increase the efficiency of existing government PDR uses and retain enough PDR space to carry out essential operations.

¹ DC Office of Planning analysis of US Census Bureau, 2022 ACS data.

Existing Conditions for PDR Land

In the District, PDR land allows for the widest range of non-residential uses while restricting most forms of housing. The majority of the District’s PDR land is located in Ward 5 where it is concentrated near railroad facilities, Metro’s Red Line corridor, and New York Avenue NE. PDR land makes up 5.2% of the District’s overall land area, which includes rail lines and other infrastructure.² The 2014 Ward 5 Works Industrial Land Transformation Study (“Ward 5 Works”), found that the amount of the District’s land that is dedicated to PDR use is low compared with other American cities. Figure 1 shows where the District’s existing PDR land and future land uses are located as reflected in the 2021 Comprehensive Plan. The blue areas are currently zoned for PDR use (PDR Zones), while the pink areas indicate locations where the Comprehensive Plan specifies that PDR uses should be retained (PDR FLUM). DC Village and Blue Plains, at the southern end of the District, are institutional uses, which will remain in the future. They are designated as Local Public Facilities on the FLUM.

Figure 1. Current PDR Land and the Future Land Use Map (FLUM)



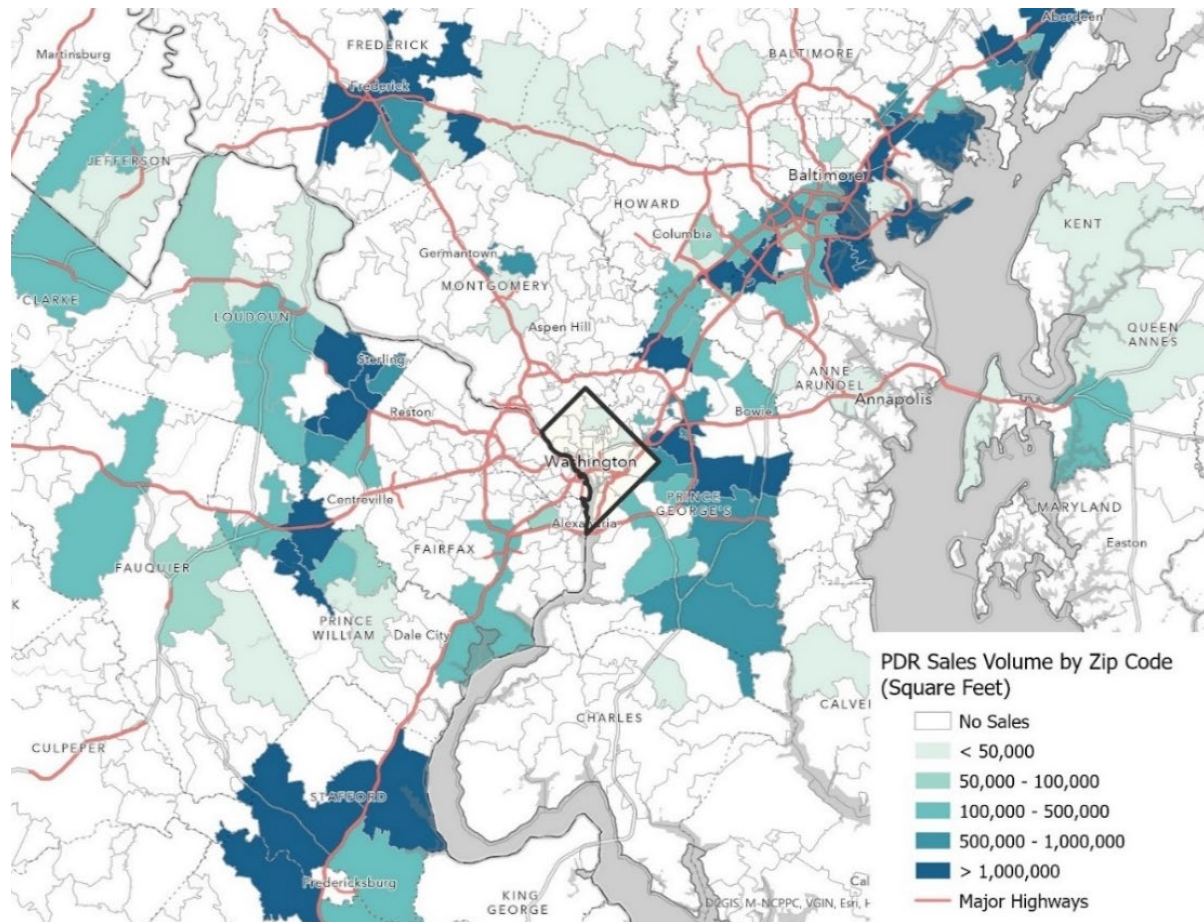
Source: [DCOZ \(Official Zoning Map\)](#), Open Data DC (Comprehensive Plan Generalized Land Use Map)

² DC Office of Planning analysis of Open DC data.

Existing PDR Supply and Demand

The District currently has 8.5 million square feet of the Washington metropolitan area's 195.7 million square feet of PDR building space. Regionally, PDR space is being added outside the Capital Beltway. Most new facilities are located near interstate highways on sites that accommodate large warehouses, which are often more than 1,000,000 square feet in size and can serve dozens of semi-trucks at once. Figure 2 shows the distribution of PDR properties in the region based on real estate sales volume in square feet and by zip code. This map shows that most of the region's PDR activity by volume is concentrated at the edge of the metropolitan region and in the Baltimore metropolitan region.

Figure 2. Rentable PDR Area by Zip Code in the Washington Metropolitan Area



Source: CoStar (2023)

A relatively small share of the region's PDR land is located within the District. The PDR uses that remain in the District are critical to its operations today and into the foreseeable future. Therefore, demand for the District's PDR land is high, and existing PDR land is almost completely occupied, with a historically low vacancy rate of 4.2%.

Most of the District’s PDR land is used by the District government, federal government, WMATA, and utilities. In the private sector, the leading PDR land uses are construction, transportation, food and beverage, cannabis, and self-storage businesses.³

Most of the PDR buildings in the District are in good condition, with only 54 buildings on PDR land in poor or fair condition, making up about 13% of all buildings used by PDR industries in the District.⁴

Most tenants need PDR buildings with at least one loading dock, oversized doors, and a large unobstructed floor area to support truck-based freight. Certain types of PDR buildings need tall ceilings and reinforced floors. However, many of the District’s PDR buildings were built to serve railroads and do not have the features required for truck-based freight. As a result, the District has limited capacity to serve businesses that need significant truck access. This is one reason some businesses prefer to operate facilities in other jurisdictions.

Rental Rates

Regionally, rents for PDR facilities increased by roughly 25% since the beginning of the COVID-19 pandemic due to high demand and limited supply. Nationally, PDR space leased for an average of \$9 per square foot per year in the first quarter of 2023. PDR space leased for about \$17 per square foot in the District compared to about \$13 per square foot in Prince George’s County, Maryland and \$10 per square foot in Spotsylvania County, Virginia.⁵

These data points suggest that the costs associated with PDR space in the District are not competitive in the regional or national real estate markets, prompting some businesses who use PDR space to find locations outside the beltway and frequently outside of the metropolitan region. The private sector PDR uses that are located in the District have strong incentives to pay the higher costs, such as qualifying for District government programs or complying with regulations that limit how goods travel across state lines.

In the next decade, rents for PDR spaces in the District are projected to increase, exceeding \$20 per square foot for existing buildings and approaching \$30 per square foot for new construction, as indicated in Table 1. These costs are much higher than industry standard rents are forecast to be in 2033. These projections indicate that long-term, private sector PDR businesses located in the District could pass higher costs on to consumers, relocate to jurisdictions where costs are lower, change business models, or take other cost-cutting measures, such as increasing automation.

³ DC Office of Planning analysis of Data Axle information.

⁴ DC Office of Planning analysis of CoStar data.

⁵ CoStar, Q1 2023.

Table 1. Forecast of DC PDR Rents 2024-2033

Building Typology	Future Rents for Existing Space	Future Rents for New Construction
Distribution	\$19 to \$21	\$25 to \$27
Manufacturing	\$20 to \$21	\$24 to \$26
Service	\$20 to \$22	\$28 to \$30
Warehousing	\$18 to \$20	\$25 to \$28
Self-Storage	\$18 to \$20	\$25 to \$28

Source: CoStar (2023)

Employment

The District’s largest private sector PDR industries measured by employment are construction, transportation and warehousing, and wholesale trade, described in Table 2. This table shows the largest PDR industries alongside the percent of change between 2012-2020. Construction represents the largest private sector PDR use in the District and the number of construction businesses and employees increased over this eight-year period. Manufacturing, wholesale trade, and warehousing decreased in number of employees and businesses. These industries include businesses that repair homes, deliver packages, and distribute alcohol. Additionally, PDR businesses can provide well-paying jobs to DC residents with a broad range of skill and education levels.

Table 2. Employment Trends for Privately-Owned Industries that Use PDR Land in the District

Industry	Establishments		2012-2020	DC Employees		2012-2020
	2012	2020	Percent Change	2012	2020	Percent Change
Construction	426	496	16%	7,256	10,004	38%
Manufacturing	114	106	-7%	1,157	1,048	-9%
Wholesale Trade	436	383	-12%	4,492	3,431	-24%
Transportation, Warehousing	194	168	-13%	5,277	3,828	-27%

Source: Quarterly Census of Employment & Wages (QCEW) 2022

The District's PDR Users

OP conducted research, incorporating data analysis and stakeholder interviews, to examine the current public and private sector users of PDR land, and to gain insights on the present use and long-term needs for PDR land. This research focused on future opportunities and challenges related to PDR uses in the District, including what the users need to achieve their goals. Private stakeholder groups include companies that provide bike and scooter rentals, artists and makers, breweries, cannabis businesses, for-hire vehicles, and construction companies. Government and public sector stakeholder groups included representation from several District agencies including the District Department of Transportation (DDOT), District Department of Public Works (DPW) and regional utilities and authorities such as WMATA.

Key Findings for the District's PDR Users

- **Many District agencies and utility companies maximize their PDR land use.** Frequently, organizations need to operate District-based facilities but there is rarely land available to expand. As a result, these organizations have begun or are considering building multi-story facilities. However, multi-story facilities are more expensive, which contributes to funding challenges.
- **Private and public transportation stakeholders managing fleets share challenges related to limited space for maintenance, storage, and employee amenities such as parking, break rooms and bathrooms.** Both groups expressed that they need more space to manage and operate vehicle, bicycle, and scooter fleets. Several facilities are leased and require near-term relocation. Additionally, many are not transit accessible, resulting in most of the workforce driving to work and competing with District, resident, and business vehicles for shared street parking spaces.
- **Challenges for contracted services.** District agencies prioritize contracting with locally based Certified Business Enterprises (CBEs) to build and maintain infrastructure. Some CBEs have facilities, such as asphalt plants, that are important to the District's operations. The District will need to balance the benefit of having these facilities within the District with challenges they can present to surrounding communities.
- **Electrification is changing standard operations for public and private users.** The transition to electric vehicles, scooters, bikes, and buses requires PDR space with more electrical capacity, fire safety mechanisms, and maintenance that is not currently standard in existing PDR space. Furthermore, building, fire suppression, and hazardous materials management regulations could require District agencies to use more PDR land to meet safety standards.
- **The regulatory environment for cannabis, breweries, artists, and makers has made it difficult for business owners to find PDR space.** These PDR users face regulatory hurdles that can make it challenging to meet requirements including location and use restrictions for their operations. Some are required to work out of PDR facilities but cannot find space due to limited availability or cost. Many of these businesses could grow over the long term if they had more access to appropriate spaces.
- **Co-location is an emerging trend for private and government PDR users.** Many public and private entities operating in PDR zones expressed interest in co-locating with peer agencies, other businesses, or other uses including housing. Some District agencies already co-locate and seek to identify future co-location opportunities. This strategy improves space efficiency, can reduce the costs of new construction projects, and increases resident access to services.

- **Many PDR users are considering new location strategies to stay in the District.** In addition to co-location, there is an opportunity to provide better service to the public by decentralizing some PDR uses throughout the District. These uses include overnight bus parking, bike and scooter rental business maintenance and distribution, debris management from extreme weather events, and parking for lightweight District vehicles. Without space where PDR uses are allowed to expand or spread into, some public and private PDR users may need to consider space outside of the District.

Government and Utility PDR Land Users

The District, federal government, regional utilities, and authorities are municipal users of PDR land. These essential services require PDR land separated from places where people live because they can be dangerous. Government and utility PDR users own or operate 1,124 acres of land within areas zoned for PDR, accounting for 62% of PDR land in the District. Non-buildable areas, such as roadways and sidewalks make up 4% of PDR land. Government and utility PDR are critical to the District’s operations and support essential services, which need to be preserved.

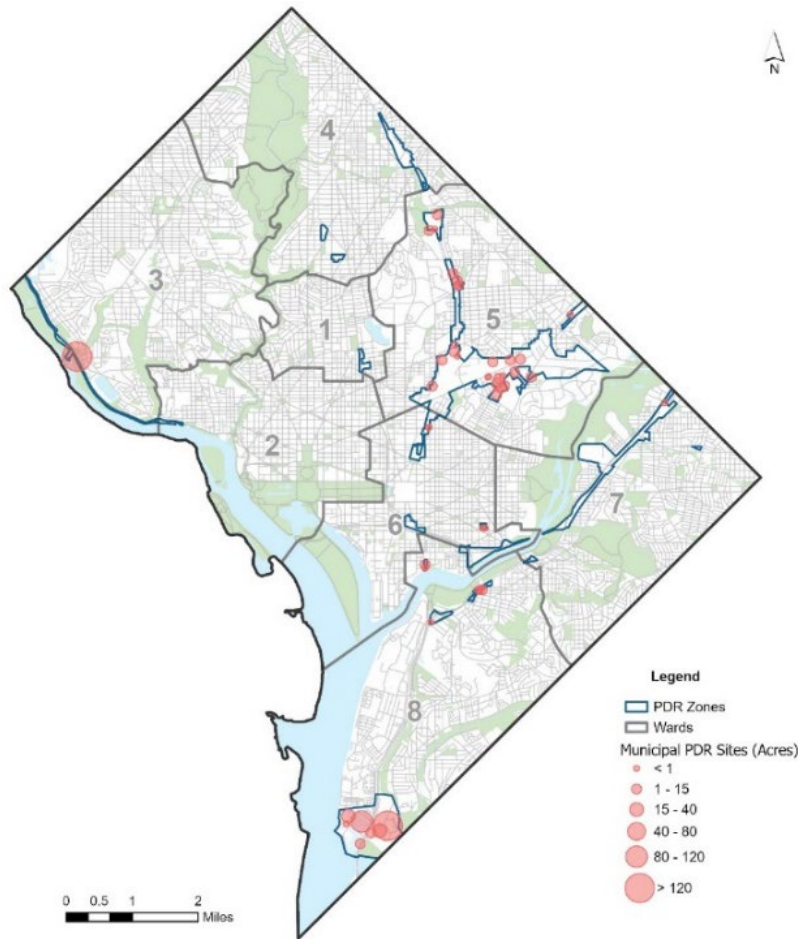
Together, these municipal PDR uses require 66% of the District’s PDR land. Additionally, these uses are supported by private sector contractors, such as companies that repair roadways who work closely with municipal PDR users. To meet the needs for essential private sector contractors, the District should retain an additional 4% of the District’s PDR land exclusively for PDR uses. Putting these three categories together, the District should retain 70% of PDR land for PDR use to meet its current and future municipal needs.

The majority of government and utility PDR uses can be organized into the following categories:

- **Vehicle maintenance and management** – properties that house, maintain, manage, or support vehicle fleets or properties that utilize heavy vehicles for operations.
- **Bulk material storage** – properties for outdoor or enclosed bulk materials storage, such as salt domes, which enable the District to treat slippery roadways.
- **Warehousing and logistics** – properties that are used to store and stage materials and equipment for distribution or use throughout the District.
- **Shops, labs, and repair** – properties that house maintenance shops and repair services.
- **Operational bases** – properties that house administrative or operational offices to support government and utility PDR functions.
- **Utility infrastructure** – properties that house critical infrastructure and facilities related to the supply, delivery, and management of water and energy.
- **Special uses** – properties with unique uses that do not fit into the categories above, such as waste transfer stations and Fire and Emergency Medical Services (FEMS)/Metropolitan Police Department (MPD) training facilities.

The location and lot size of government and utility PDR facilities (excluding transit and rail infrastructure) are shown in Figure 3. The largest government and utility operations are located at the southern end of the District where DC Water’s Blue Plains Advanced Wastewater Treatment Plant is located along the eastern edge of the Potomac River and near the Palisades where there is legacy infrastructure related to the C&O Canal.

Figure 3. Government and Utility PDR Uses in PDR Areas



Source: DC Open Data ([District Government Land](#), [Common Ownership Lots](#))

Table 3 describes the area of PDR land dedicated to government and utility PDR uses and their operating entity. Within the District government, the primary users of PDR land are DPW, DDOT, MPD, FEMS, and the Office of the State Superintendent for Education (OSSE). Most of these facilities are in DC Village in Southeast, on West Virginia Avenue NE, W Street NE, and Farragut Street NE. Additionally, the federal government uses about 10% of all PDR land in the District for a central post office processing facility, federal infrastructure including power generation, and operations that support federal facilities.

Table 3: Total Land Area of PDR Zones Dedicated to Government and Utilities PDR Uses By User

Entities	Total Acreage	% of Municipal PDR	% of all areas zoned for PDR
Utilities	366	30%	20%
Transit & Rail Infrastructure	312	26%	18%
DC Government	259	21%	14%
Federal Government	187	16%	10%
Transportation ROW	81	7%	4%
TOTAL Government & Utility PDR	1,205	100%	66%

Source: DC Open Data ([District Government Land](#), [Common Ownership Lots](#))

Several agencies shared their challenges with limited PDR space and are considering adding vertical space, such as parking garages or a second story to operational bases. However, the agencies considering vertical space are concerned about the additional costs. Some agencies cited construction costs up to five times higher for parking garages compared to construction of an at-grade parking facility. While the costs are high for vertical growth, it is one of the few options agencies have to meet their growing needs.

Most government and utility PDR facilities must be within the District because they service District residents and businesses. One agency shared, “Do we need more land? The answer is yes. And it needs to be in the District to effectively serve the people who live here.” Some services, such as school transportation, are time-bound, and other services, such as disaster and emergency response, are required with little or no notice. The agencies shared that critical services would be impaired if government PDR operations were not located in the District.

Some agencies with similar missions and PDR uses co-locate to meet their space needs. However, this does not work for other agencies that have unique requirements. For example, FEMS vehicles have special maintenance needs, which prevent their support facilities from serving other District agencies.

Private Sector PDR Land Users

The District’s private sector demand for PDR facilities is almost entirely met by large facilities outside the Capital Beltway. Among PDR businesses located within the District, many serve the government and qualify for the local Certified Business Enterprise (CBE) program. Some PDR businesses make products that appeal to consumers who prioritize goods that are produced in the District. Others, such as alcohol distributors and cannabis cultivators, have legal requirements to do business in the District. Additionally, some long-standing PDR businesses own their facilities and have well-established operations that are difficult or undesirable to relocate. Private sector PDR operates on 34% of PDR land today and 30% should be preserved commercial use in the future. Many of the District’s private sector PDR uses, such as commercial kitchens and small appliance or electronic repair shops, could be located in mixed-use buildings.

The majority of private sector PDR businesses are in five industries:

- **Construction** – facilities that support asphalt and roadway construction and maintenance, build facilities for District operations, and repair and install roadway infrastructure such as traffic signals.
- **Manufacturing** – includes facilities where food, beverage, and cannabis industries make their products for consumers.
- **Wholesale Trade** – includes facilities that distribute and sell merchandise to other businesses for resale, often without value added processes.
- **Transportation and Warehousing** – uses that support industries that provide transportation of passengers and cargo, warehouse and store goods, and support activities related to modes of transportation.
- **Other Industries** – includes mechanics and other services to District residents, businesses, and agencies.

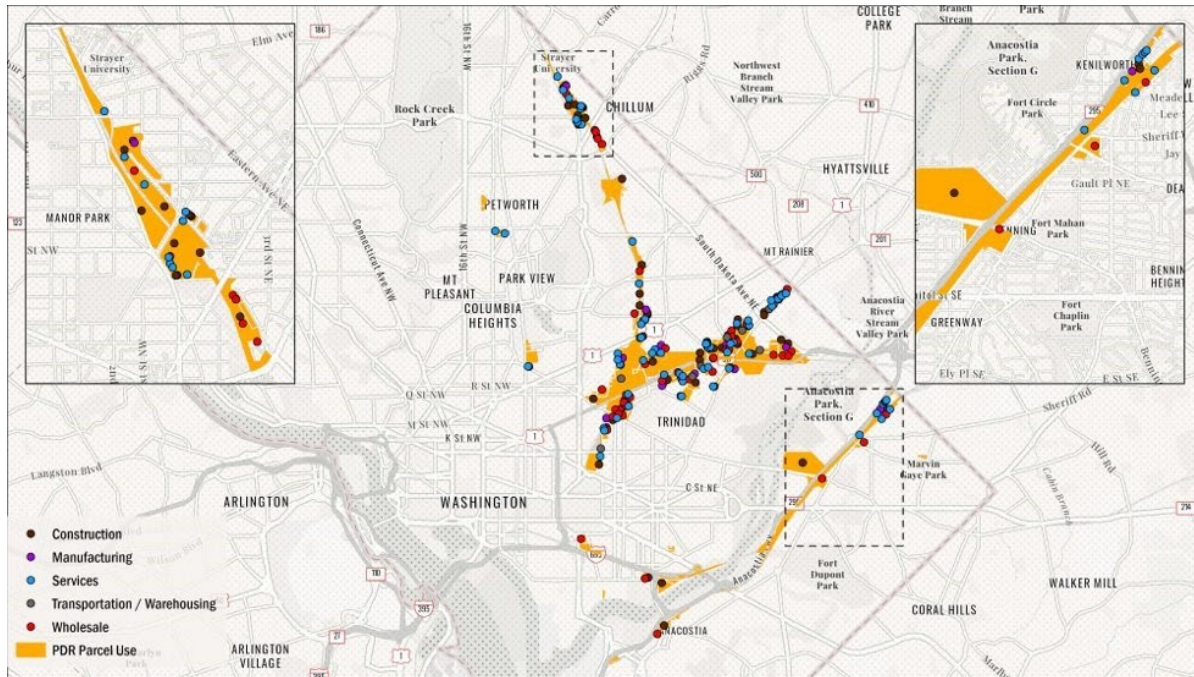
Each PDR industry has unique space needs and varying levels of intensity. Construction companies serve a vital role in the District including constructing public buildings and maintaining roadways. Some construction activities can have impacts on surrounding areas and should be separated from residential uses. Wholesale, manufacturing, and other industries also provide important services such as selling and distributing goods, making products, and providing storage facilities. Low impact PDR users such as light manufacturing, repair, or maker businesses can have little to no impact on nearby communities. Table 4 shows the total area dedicated to private PDR uses by industry, and Figure 4 shows where businesses providing services, such as auto repair, maintenance, and warehousing, are located.

Table 4. Total Land Area Dedicated to Private PDR Stakeholders

Industry	Total Acreage	% of Private PDR	% of all areas zoned for PDR
Construction	266	38%	13%
Manufacturing	59	8%	3%
Wholesale Trade	123	18%	6%
Transportation and Warehousing	88	13%	4%
Other Industries	165	23%	8%
TOTAL Private PDR	701	100%	34%

Source: Data Axel

Figure 4. PDR Business Locations



Source: Data Axle

Industry Spotlights:

Access to PDR spaces is critical to the long-term success for several industries that operate in or serve District residents and businesses. Several private sector stakeholders stated, “we’re open to co-locating,” because of its potential to meet their needs and benefit the community. This could be co-location with residential or other commercial uses to offset rising costs and competition for limited space.

- Scooter and Bike Share-** Over the past decade, electric scooters and bike sharing have increased in popularity, and the number of people using these services is expected to continue rising as battery technology improves and users become more comfortable sharing the roadways. “People are riding more and more consistently than ever. It’s all space and logistics now to keep costs down and to service the heart of DC,” said one bike and scooter company. Several bike and scooter share companies expressed interest in relocating existing operations facilities from one centralized location in PDR areas to several smaller decentralized locations closer to their customer base downtown.
- Breweries and Distilleries -** Breweries and distilleries are another common use of the District’s PDR land. These businesses are community assets that help residents feel more connected to the District by providing locally made consumer products. However, numerous businesses in these sectors are encountering challenging financial conditions. For instance, the brewing industry has many suppliers, a declining rate of alcohol consumption, and increased competition from emerging products such as alcoholic seltzer. Additionally, brewers reported difficulty finding PDR space they could afford to operate their businesses. The District has the largest

number of Black-owned beer brewers in the country. However, many are struggling to reach a sustainable scale because of a lack of affordable space.

- **Cannabis** - Cannabis cultivation and manufacturing are a private sector PDR industry whose activities are closely regulated and are limited to PDR land. Cultivation and manufacturing are required to operate out of secured facilities that cannot be shared with other uses or activities. However, there may be opportunities in the future to explore appropriate land uses to support the District's growing cannabis industry. There is more demand than available space for entrepreneurs seeking to enter the District's market as producers or retailers. The District has recently created a special category of cannabis business license to provide equitable access to the cannabis market. This program serves people who have been disproportionately harmed by the criminalization of cannabis by ensuring they are included in today's industry, including returning citizens and their family members.
- **Food Businesses** - Food businesses have access to some incubation and shared kitchen spaces in the District. However, businesses that start in these spaces are facing challenges moving into their own facilities because the costs are too high. This issue limits the number of businesses the District's incubators and shared kitchens can serve. It is possible that delivery-only restaurants in PDR areas could create access to more affordable space and support more access to entrepreneurship in the District.
- **Artist and Makers** - Artists and makers are another group of stakeholders using PDR space. Many artists and makers struggle to find space they can afford in the District. As a result, people frequently work in spaces with informal agreements where they do not have protection from eviction, which can result in lost equipment and products. Supportive spaces, such as incubators, are PDR uses that are important to the District's creative economy. The work of many artists and makers can be safely co-located with or close to residential uses. For example, artist live/work space is one of the few forms of residential use allowed in some PDR zones.

Racial Equity Analysis

Prioritizing racial equity while meeting the District’s need for PDR land is important. To inform the District’s approach to PDR land use policy, OP analyzed how PDR land impacts racial equity. This analysis is based on the Office of Racial Equity’s (ORE) Racial Equity Impact Assessment. Additionally, one of the guiding concepts for this analysis is the District’s Comprehensive Plan definition of racial equity, which states “equity exists where all people share equal rights, access, choice, opportunities and outcomes, regardless of characteristics such as race, class, or gender.”

This analysis evaluates how key factors impact racial equity outcomes. These factors include evaluating the legacy of discriminatory planning practices and identifying areas where People of Color, including Black people, and people with lower than average incomes are more likely to live, where health outcomes are worse, and housing costs are high.

By evaluating these factors, this analysis answers three key questions:

1. Who lives near PDR lands and why?
2. How are nearby residents affected by PDR uses today, and how might they be impacted in the future?
3. What planning approaches can mitigate the negative impacts of PDR uses today and in the coming decades?

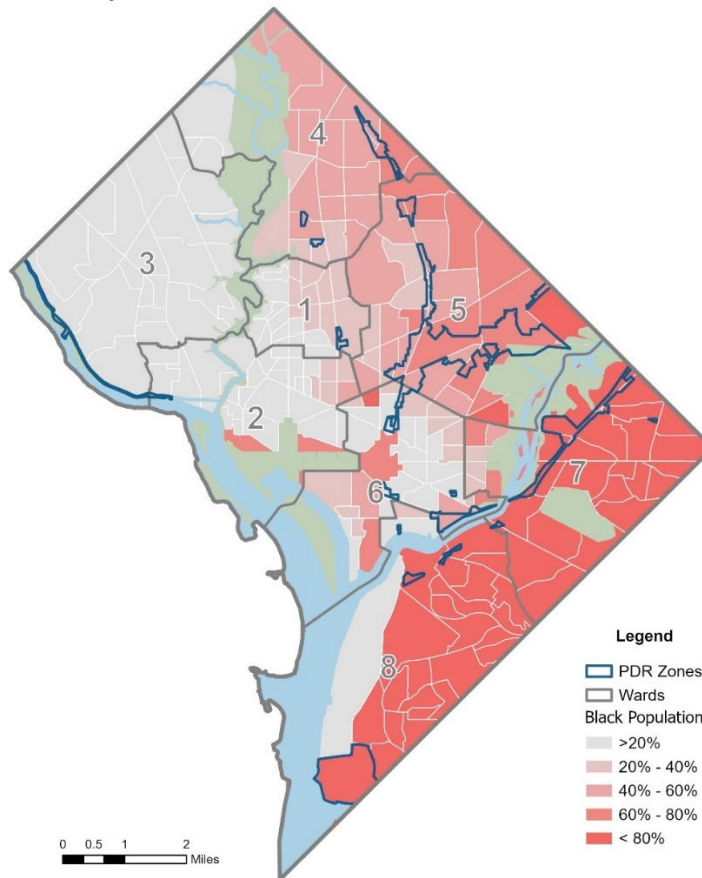
A majority of PDR land is located in Ward 5 along New York Avenue NE and the Red Line corridor. Current and future residents who live near PDR land are likely to be the most impacted stakeholders in the land use policy decision-making process. Other stakeholders include the business owners, employees, and end users who are most likely to benefit from PDR land and spaces.

Context

Many communities near the District’s PDR areas are predominately home to residents who are Black or People of Color. As of 2022, 76% of residents who live within census tracts where more than 30% of the land area is dedicated to PDR identify as Black, while 45% of District residents identify as Black.⁶ Figure 5 shows demographics by census tract, illustrating the higher percentage of Black residents near PDR land.

⁶ DC Office of Planning analysis of US Census Bureau, 2022 ACS data.

Figure 5. Black Population by Census Tract

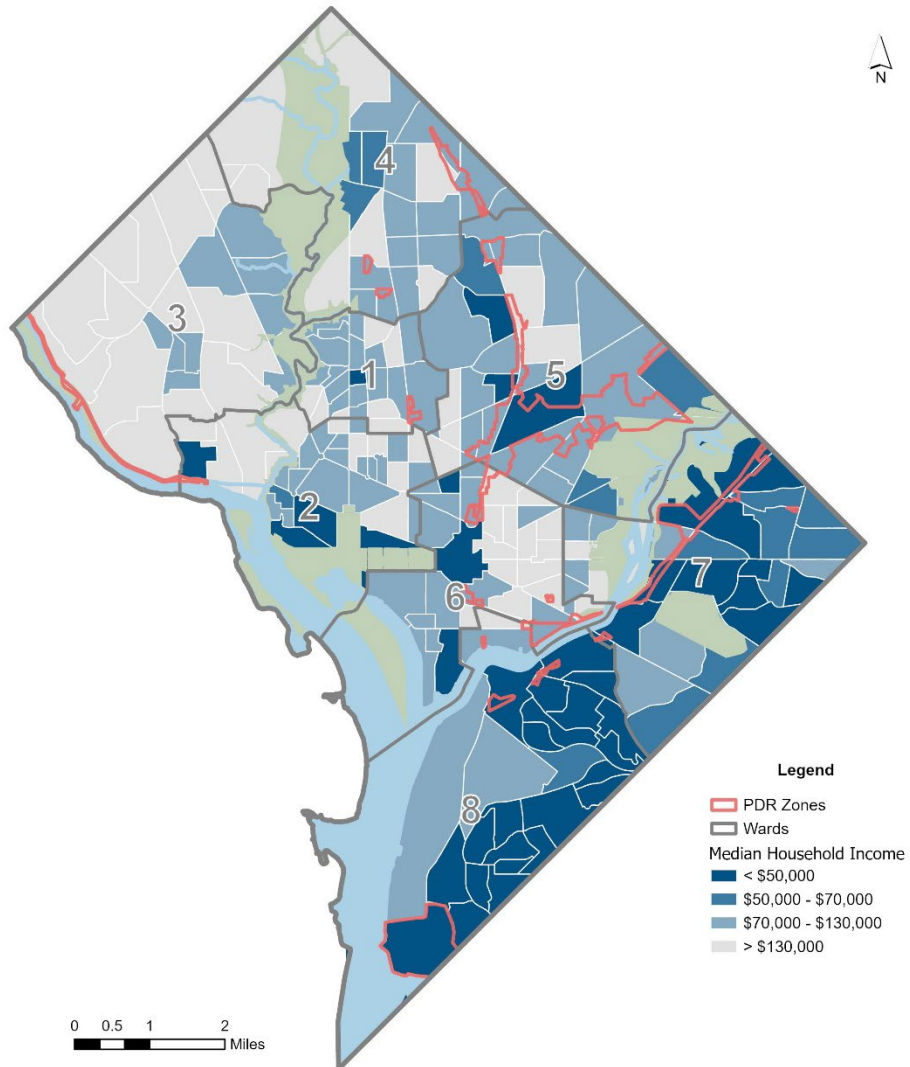


Source: 2022 ACS Social Characteristics by Census Tract, 5-year estimates

Currently, people who live near the District’s PDR lands tend to have lower incomes, higher housing cost burdens, and experience higher rates of chronic illness. The median household income for residents who live within census tracts with more than 30% of the area dedicated to PDR is \$48,996, compared to the District-wide median household income of \$93,547.⁷ Figure 6 shows the lower median household incomes near PDR land where there are more Black residents.

⁷ DC Office of Planning analysis of US Census Bureau, 2022 ACS data.

Figure 6. Median Household Income by Census Tract



Source: 2022 ACS Economic Characteristics by Census Tract, 5-year estimates

Because people who live near PDR areas have lower than average incomes, they are also more likely to have higher rates of housing cost burden. In census tracts near PDR areas 30% to 50% of households are housing cost burdened, which means that they pay more than 30% of their income for housing costs.⁸ If a household is cost burdened, they are likely to have less ability to overcome destabilizing events, such as a serious illness or job loss. Consequently, households that are housing cost burdened are at elevated risk for displacement and becoming unhoused.

DC Health’s 2018 Health Equity Report shows that life expectancy is shorter in PDR areas than more affluent parts of the District, such as neighborhoods west of Rock Creek Park. This disparity ranges from a maximum of 18 years between Woodley Park, where life expectancy is highest, and Trinidad, where

⁸ DC Office of Planning analysis of US Census Bureau, 2022 ACS data.

life expectancy is among the lowest. Other areas such as Edgewood along the Metro Red Line corridor have life expectancy that is about 10 years lower than Woodley Park.

According to DC Health, the causes of these disparities are closely connected to lower access to economic opportunities, lower access to housing that is affordable, fewer transportation options, less access to healthy food and healthcare, and more exposure to homicides and suicides. These conditions contribute to elevated rates of heart disease, cancer, asthma, and other serious health conditions in these areas.

How We Got Here

Historically, many Black people and other marginalized populations have lived near the District's PDR areas to access jobs. For example, Ivy City is a place where many Black people moved in the late 1800s to work for railroad and brick making companies.⁹

PDR land uses were distributed more evenly across the District in the past. PDR facilities were located along railroads and waterfronts where trains and ships transported raw materials and manufactured products. In the early-to-mid 20th century, policymakers introduced racist policies and practices, implemented through zoning codes, which concentrated PDR land near Black communities. This harmed Black communities and devalued their land while making land in whiter communities, separated from industrial zoning, more valuable.

In the District, PDR areas deteriorated in the second half of the 20th century as new facilities were constructed in the suburbs. Waterfront PDR areas had some of the most impactful industries and were redeveloped first because the rivers were rehabilitated following the federal Clean Water Act, which was adopted in 1972. This created desirable waterfront views, added value, and facilitated redevelopment. Over decades, PDR areas in communities including Georgetown, Foggy Bottom, Buzzard Point, Southwest Waterfront, and Navy Yard were rezoned and redeveloped into as housing and office space, which were the most uses to the District. These policy changes and market forces resulted in the District's PDR lands contracting until they were concentrated in just a few communities.

Where We Are Going

The racial equity analysis from this report will inform the upcoming Comprehensive Plan rewrite. In addition, the recommendations and key findings will contribute to the decision-making process for PDR land use policy. Equity, affordability, and resilience are key focus areas for the rewrite. Adopting a PDR retention policy to meet District needs and implementing mixed-use PDR that allows residential uses will provide several equity and resilience benefits. These include protecting needed PDR land for intensive uses, creating needed housing, more equitably sharing the impacts of essential uses, and incorporating some lighter PDR uses that provide employment opportunities such as bakeries and coffee roasters.

Areas that remain as PDR land often have lower air quality because they are close to highways and railroads. Some of these areas also have a higher surface air temperature because there is less tree canopy according to the DOEE's Climate Ready report. The New York Avenue NE corridor has the largest remaining concentration of PDR land in the District.

⁹ Rebecca Summer, "'This Is Ivy City;' An Iconic Building's Role in Gentrification and Neighborhood Identity in Washington, D.C.," *Buildings & Landscapes* 25, no. 1 (Spring 2018): 25-26.

There may be emissions and impacts from PDR uses that directly affect nearby residents. These are being monitored at several locations by DOEE and the EPA. Ward 5 Works includes strategies to improve air quality with landscaping that manages runoff and separates PDR uses from places where people live, noise mitigating barriers, and technologies that transform industrial waste into energy for heating and cooling. Additionally, the District is working to accelerate electrification of vehicles that are owned by the government, businesses, and residents, which will help improve the air quality on the roadways near PDR areas.

Outlook for PDR Land

New technologies and trends will affect the ways businesses run and government and utility services are delivered, which in turn will affect PDR land and spaces. The amount of available PDR space affects PDR users today and has the potential to limit growth opportunities. The future of PDR land could be defined by new technologies and emerging trends and introduce new approaches to meeting demand.

Changing Technology and Emerging Trends

Many PDR industries are investing in new technology to produce goods and materials faster and at lower costs. These technologies include automation, advanced route planning, and new facility designs that make businesses more efficient. Some of these technologies could safely be mixed with commercial land uses, including new types of fulfillment centers that are about the size of a pharmacy.

Ecommerce Fulfillment

The COVID-19 pandemic accelerated the shift to online shopping. In 2023, the Federal Reserve reported that ecommerce represented 15.1% of all retail sales, which is an increase of nearly 50% from the rate in 2018, which was 9.4%.

To meet this demand, ecommerce companies have typically used large, land-intensive fulfillment centers to sort, package and ship items to customers. However, the speed that customers expect to receive their online purchases has increased. Just a few years ago, two-to-three-day shipping was typical, today same day shipping is common, and one-to-two-hour delivery is an emerging trend in the industry.

As the demand for same-day delivery expands, ecommerce retailers including Amazon, Walmart, and Target, as well as logistics companies, such as UPS and FedEx are constructing a nationwide network of smaller fulfillment centers that are located closer to customers.¹⁰ In the DC metropolitan region, most of these facilities are located in suburban jurisdictions near the Capital Beltway where they have access to major transportation routes and the largest number of customers during a day of deliveries.

In the short term, consumers are prioritizing same-day and next-day deliveries, with a preference for certainty over speed. Additionally, large retailers, such as Target and Walmart, are adapting their retail stores to function as fulfillment centers to respond to customers' growing demand for same-day delivery and "buy-online-pick-up in-store" business models.

Vertical and Automated Warehousing

Automated warehousing systems and order fulfillment robots are increasingly prevalent. These technologies enable goods to be stored more densely and at greater heights. In recent years, warehouse floor-to-ceiling height standards have increased from 24-36 feet to 36-40 feet to provide more vertical storage space. These are single story buildings that have very high ceilings. It is expensive to meet fire suppression requirements for taller buildings, which is why very few businesses operate warehouses that are more than 45 feet tall.

Automated systems and robots have reduced the number of employees required to staff the warehouses. While a smaller workforce may reduce traffic to and from the warehouse and parking

¹⁰ "Urban fulfillment centers: Helping to deliver on the expectation of same-day delivery." Deloitte, 2019.

needs, automation also reduces the benefits of having this type of facility in the District. These facilities generate fewer employment opportunities and less income for residents and tax revenue for the government than conventional facilities. However, it is likely that automated warehouses will provide desirable services for residents and businesses.

Electric Vehicles

The need for gasoline and diesel powered vehicle repair is forecast to decline over the coming decades due to the global transition to electric vehicles. Electric vehicles require roughly half as much routine maintenance as internal combustion cars, which is likely to make it more difficult to operate small repair businesses. Additionally, when electric vehicles do need repairs, they often require specialized work that is more likely to be completed by dealers or larger specialists. Because this work is rarely needed, it is unlikely that customers will pay a higher price for facilities located in the District.

Autonomous Vehicles

Autonomous vehicle technology has the potential to disrupt existing delivery models and alter government PDR operations. Once autonomous vehicles are market-ready, their deployment for deliveries could dramatically reduce the costs for same-day and same-hour ecommerce delivery because they will reduce the labor costs for these services, which would increase demand.

Autonomous vehicles could take many forms, including sidewalk robots. DDOT currently permits sidewalk robots to reduce roadway demand for deliveries. While autonomous vehicles are promising in terms of cost savings and efficiencies, these technologies are unlikely to be a significant factor in the short-term because the underlying technologies are still under development.

Demand for District PDR Space

Growth projections for major PDR industries consider changes to industry, space needs, and the number of employees, all of which affect how much demand there is for industrial space in the District. The District's high cost for industrial space is also a factor compared to more affordable spaces in surrounding jurisdictions, which may prompt some relocations. Table 5 shows the forecast change in demand for PDR business and jobs in the District by industry between 2020 and 2030. Note, some of the businesses and jobs that will meet the District's demand will be located in other jurisdictions.

The demand for government and utility providers and the private businesses that support them are projected to grow minimally through 2030. New facilities are likely to be multi-story and include more advanced technology. A modest number of utility jobs are expected and are unlikely to relocate because they serve fixed infrastructure and support timely access to specific sites.

Some industries, such as construction, will grow over the coming decades as the demand for housing increases. Many construction businesses are incentivized to remain in the District for the CBE program. They may operate storage facilities outside of the District as PDR spaces become harder to find.

Manufacturing has a less certain forecast. In the District, the food and beverage industry as well as cannabis industry will likely see growth for District-made and branded products. In addition, these industries will need PDR spaces, which increases the competition for already limited space. Due to these factors, it is likely that traditional manufacturing businesses will use facilities outside of the District.

The District’s demand for wholesale trade employment is forecast to grow. However, very few of these jobs are likely to be located in the District because the vast majority of the District’s wholesale demand is met by facilities in nearby jurisdictions.

Demand for transportation and warehousing jobs is expected to grow. Over 75% of these jobs are in transit and ground passenger transportation, which are unlikely to move to other jurisdictions because the facilities where these jobs are based need to be close to the people they serve.

Waste management is an important part of the District’s operations and is forecast to grow. Most of this growth is likely to occur outside of the District where there are established facilities. Currently, the District government collects waste from residential buildings with less than four housing units and private companies collect waste from larger residential buildings and commercial buildings. The District does not expect to add a lot of residential buildings that would have their waste collected by the government. Currently, most privately collected waste is processed outside of the District.

The repair and maintenance industries are forecast to grow along with the population, which reflects residential and commercial demand. The number of jobs is expected to remain small. Much of this industry is anticipated to relocate to other jurisdictions because of misalignment between business models and available PDR space and costs in the District. In addition, as electric vehicles become more common, demand for regular maintenance that sustains many of these businesses will decrease.

Table 5 shows the forecasted growth rate and number of jobs expected by industry from 2020 to 2030.

Table 5. Projected Employment and Industry Forecasts from 2020-2030

Industry	Forecasted Growth Rate 2020-2030	Projected Net New # of Jobs (2030)
Utility	2.3%	2,000
Construction	10%	16,500
Manufacturing	7%	1,600
Wholesale Trade	7.9%	5,400
Transportation and Warehousing	9.2%	6,700
Waste Management	14.9%	600
Repair and Maintenance	13.9%	700
TOTAL Forecast Job Growth		33,500

Source: DOES and IHS Industry Estimates

PDR Strategy

To inform the Comprehensive Plan rewrite, OP developed a framework for PDR land use in the District and recommends next steps.

The District's current Future Land Use Map (adopted in the 2021 Comprehensive Plan Update) identifies one dedicated PDR land use category and several densities of mixed-use PDR land use designations. The framework for PDR space adds additional clarity by distinguishing between types of PDR land.

A Framework for PDR Space in the District

The District should continue buffering places where people live from the most impactful PDR uses with less intensive PDR uses, landscaping, visual screens, and commercial uses. Railroad lines and highways also serve as barriers that can separate the most impactful PDR uses from places where people live and recreate.

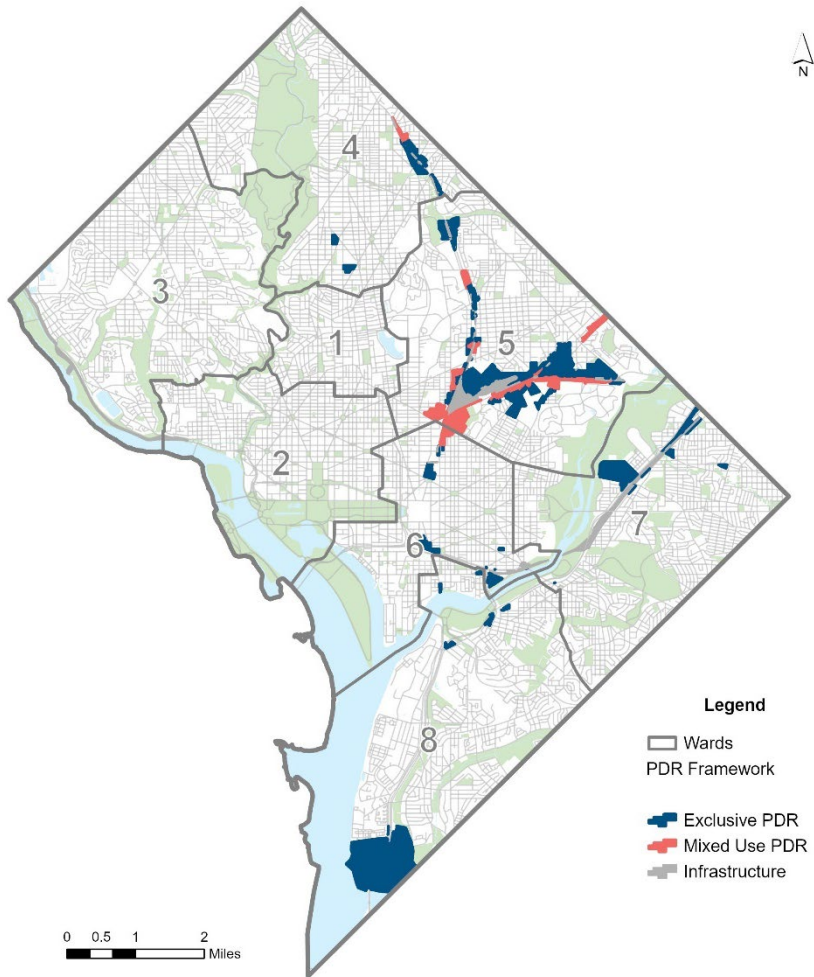
PDR Policy Approach

PDR land use policy can encourage the separation of dangerous uses from places where people live and support innovations from private and public sector PDR users to meet their space needs. The District's PDR land use policy recognizes that some but not all PDR uses are dangerous for people to live near. There are opportunities to secure PDR spaces while meeting goals for more housing.

To guide this analysis, OP is proposing two types of PDR land: exclusive and mixed-use.

- **Exclusive PDR** land should make up 70% of preserved PDR land and be exclusively for PDR use. These are areas where important government facilities or facilities that support government operations, such as trash transfer stations, are located. These areas could be examined to minimize non-PDR uses, and ensure permitted uses are appropriate for location within a heavy industrial area, and to examine ways to lessen their potential off-site impacts.
- **Mixed-use PDR** areas allow housing to be built on top of space designed for low-impact PDR uses, such as commercial kitchens. These areas will provide opportunities to live and work in the same or nearby buildings in pedestrian-oriented neighborhoods with art galleries, offices, retail, and other amenities like small parks. This and other PDR land types should also be considered as part of the Comprehensive Plan rewrite process to determine if they can be included in some types of commercially zoned areas.

Figure 7. PDR Framework Map

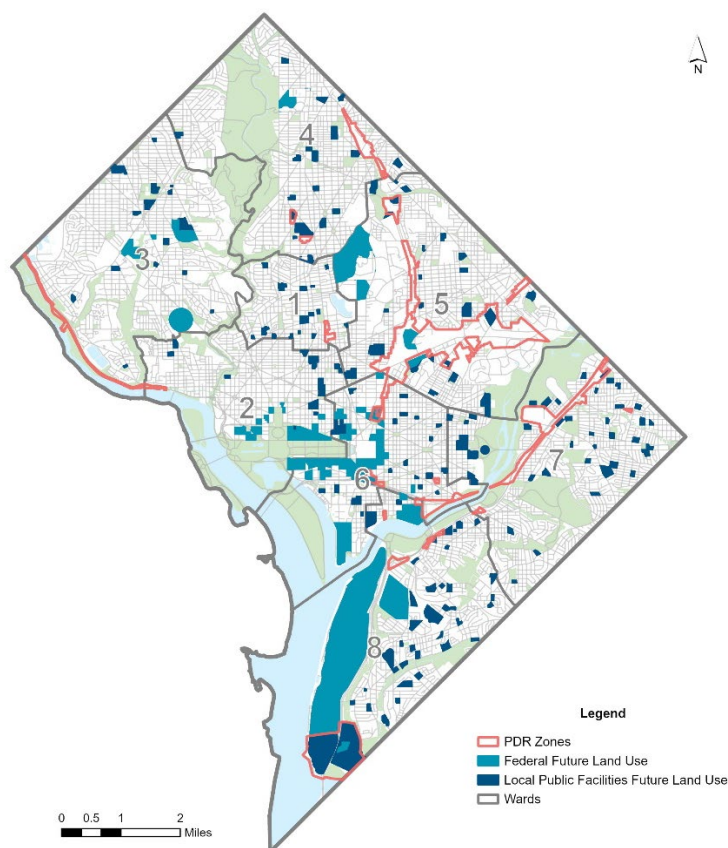


How To Implement Mixed-Use PDR Land Use

While all the existing PDR zones allow a range of industrial, commercial, and institutional uses, the District’s future land use policy includes areas that are designated for PDR mixed-use including residential. This FLUM designation would enable the District to create new or modified mixed-use zoning to make better use of its limited land area by allowing low-impact PDR uses to occupy commercial space below housing in specific areas.

Future land use policy could also be used to bring some lower intensity municipal services closer to the places they serve. Local Public Facilities can have similarities with PDR uses. For example, WMATA operates the Western Bus Division garage on Wisconsin Avenue NW in Ward 3 on a site designated for Local Public Facilities, and the Library of Congress operates a warehousing facility along Taylor Street NW in Ward 4 that is also designated for Local Public Facilities.

Figure 8. Federal and Local Public Facilities Future Land Use (2021 FLUM)



New zoning regulations could allow the production of more housing alongside lower impact PDR uses, such as breweries, shared commercial kitchens, and other maker space uses. A study focused on allowable uses in PDR zones could more fully consider and evaluate the opportunities for mixed-use PDR areas. The District should undertake this study with a focus on options for educational uses including schools and daycare services, which are beyond the scope of this report. The following questions frame some possibilities for the mixed-use PDR land use designation.

What could be the building requirements for structures within mixed-use PDR zones?

In a mixed-use PDR building, at least half of the area on the ground floor should be dedicated to uses where products are manufactured, distributed, or repaired. This could be combined with a retail component associated with the production area. The upper floors should be dedicated to residential or office uses. A mixed-use PDR building must include features that support both PDR industries and less intensive uses such as office or residential. Ground floor PDR spaces would include reinforced floors, loading docks, large garage bays, soundproofing and insulation, and an exterior treatment (such as windows, murals, or other aesthetically pleasing design elements) to create the feel of a vibrant commercial corridor.

What types of businesses or industries could operate in mixed-use PDR buildings?

Several businesses and industries can be compatible with residential uses. A few examples include commercial kitchens, creative studios, bike and scooter rental operations facilities, maker space, breweries, hydroponic farms, and small-scale micro-fulfillment centers. Key characteristics of these businesses and industries are that they do not produce or work with dangerous chemicals, they do not produce hazardous emissions, and they do not generate significant heavy vehicle traffic or sound pollution.

What are some examples of mixed-use PDR buildings and zoning?

- BRT “Pulse” Corridor – Richmond VA - Richmond, Virginia's 2020 Master Plan, "Richmond 300," introduced industrial mixed-uses for areas transitioning from traditional industrial to higher-density residential and commercial areas. Most of these areas are along the corridor served by their new bus rapid transit system, the "Pulse," which has significantly changed market conditions for real estate development. These new mixed-use industrial areas will feature residential, retail, office, and light industrial users in renovated historic buildings and new construction.
 - Source: [Richmond 300: A Guide for Growth](#)
- Potrero Power Station, San Francisco CA – The Potrero Power Station, on the eastern edge of San Francisco, is undergoing redevelopment after sitting vacant for over a decade. The 29-acre former power station redevelopment will include a mix of uses, including over 2,000 new housing units, 650,000 square feet of life science and laboratory space, and 35,000 square feet for PDR uses. San Francisco’s central waterfront has been a center for industrial activity for over a century, and the city is working to adapt the space to meet the city’s growing demand for housing while supporting emerging businesses and industries.
 - Source: [Potrero Power Station](#)

PDR Land Use Conclusions

The District has reached a key decision point for its PDR land. These areas are well-used, and it will be important to preserve PDR lands for the District's operations and economic vitality. There is an opportunity to both protect land for more intensive PDR uses and reuse some PDR land to create needed housing and more equitably share the impacts from essential uses. There may also be an opportunity to incorporate some lighter PDR uses, such as bakeries and maker spaces, into mixed-use PDR areas, adding vitality and employment opportunities to more neighborhoods.

Applying a PDR framework that updates PDR use as Exclusive and Mixed-use PDR will support the District in accommodating current and future needs. Exclusive PDR areas are parts of the District that house critical government and utility functions and specific private businesses the District relies on. The District should preserve 70% of PDR land for Exclusive PDR. These areas would be for the most intensive uses, such as trash transfer stations, and would be separated and buffered from where people live. This includes a base of operations for a construction company, a sound stage, or a 3D printing studio. The District should preserve 30% of PDR land for mixed-use PDR areas. This is where many of the District's small and medium sized PDR businesses can be safely located alongside places where people live, learn, and recreate. For example, bakeries and commercial kitchens can safely be located in the same buildings where people live.

The location of PDR land has changed over time because of economic shifts and discriminatory planning practices. Over decades, PDR land use receded from many parts of the District and were replaced by apartments and office buildings, including the neighborhoods of Georgetown, Foggy Bottom, Southwest Waterfront and Capital Riverfront. This pattern left communities such as those along New York Avenue NE and Metro's Red Line corridor, where Black people and people with lower incomes are more likely to live, with more PDR land uses nearby. This has contributed to adverse health outcomes and other negative impacts that can be addressed through an updated PDR land use policy.

Next Steps

This report recommends four next steps for District government. Table 6 outlines the recommendations along with descriptions of what each should do, their outcomes, timeframe, and agency leads.

Table 6. PDR Recommendations

#	Next Step	Description	Outcomes	Timeframe	Leads
1	Adopt a PDR retention policy in the Comprehensive Plan rewrite	Retain PDR lands that are currently designated on the Future Land Use Map. The District should preserve 70% of existing PDR land for exclusive PDR use for government and utility facilities. Evaluate mixed-use PDR designations for the remaining areas.	The District government, WMATA, PEPCO, Washington Gas, and DC Water will have the facilities to meet the District’s needs while making space for companies that provide goods and services that residents want, such as transportation, food delivery, and parcel delivery.	0-4 years	OP
2	Establish new mixed-use PDR zoning designations that allow residential uses	Create new mixed-use zones that incorporate PDR and residential uses. These zones should include electric vehicle charging provisions, updated fire safety mechanisms, as well as requirements for screening.	These zones will enable needed housing to be built while producing space for businesses to make goods and provide services for District residents.	0-2 years	OP
3	Update zoning that is used to implement the Comprehensive Plan’s future land use policy for commercial and local public facilities uses	Identify opportunities in areas with commercial, mixed use, and local public facilities future land use designations to allow lower impact PDR uses such as beverage production, commercial kitchens, and housing vehicle fleets.	These facilities will create more opportunities for residents to start businesses, improve residents’ access to these facilities, reduce the environmental impact of these services, and decrease demand on limited PDR land.	0-3 years	OP
4	Identify and pursue opportunities to co-locate DC government facilities	Some government or utility PDR operations can be combined in a single, more efficient facility.	Increase the efficiency of existing DC government PDR uses and retain enough PDR space to carry out essential operations.	0-10 years	OP, DGS, DMPED, DPW, DDOT, FEMS, MPD

PRODUCTION,
DISTRIBUTION,
REPAIR LAND
USE REPORT

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