D.C. POLICY CENTER

The Alice M. Rivlin Initiative

REMOTE WORK AND THE FUTURE OF D.C.

What does remote work mean for the competitiveness, economic growth, and fiscal strength of the District of Columbia?

CONTENTS

01 WHY STUDY REMOTE WORK?

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REMOTE WORK IS LIKELY HERE TO STAY AND IS BREAKING THE RELATIONSHIP BETWEEN WHERE WE LIVE AND WHERE WE WORK.

This has implications on the District's attractiveness, competitiveness, economic growth, and fiscal health.

Population impacts: Historically, obtaining a job in the District has been the primary force of domestic (and international) in-migration. Prior to the pandemic, 42 percent of newcomers to DC did so because of a career change, 14 percent to attend college, and 10 percent to ease commute times and 5 percent for other job reasons.

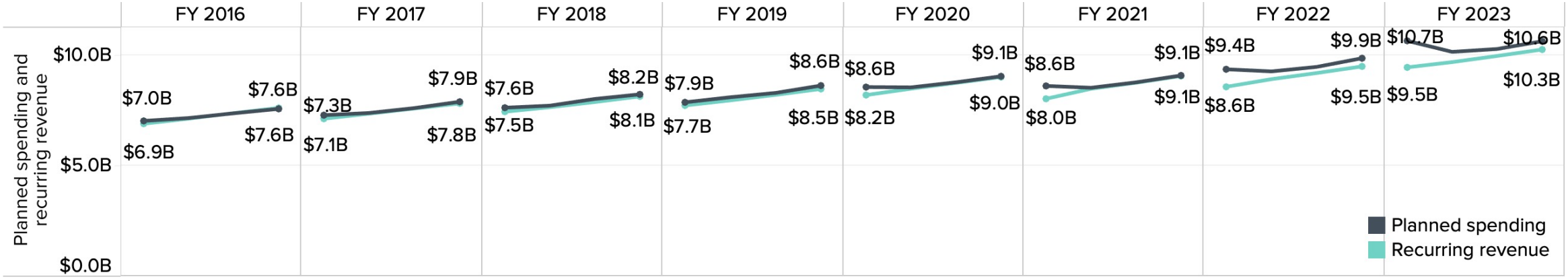
Local service economy impacts: District's economy has benefited greatly from the presence of commuters. Local service economy (retail, restaurants, personal services) was one of the largest sources of job growth prior to the pandemic. Jobs in this sector pay 50 percent more if in DC compared to suburbs.

Demand for office space: The District's ability to attract workers translated into strong office demand, high office valuations, and high tax revenue.

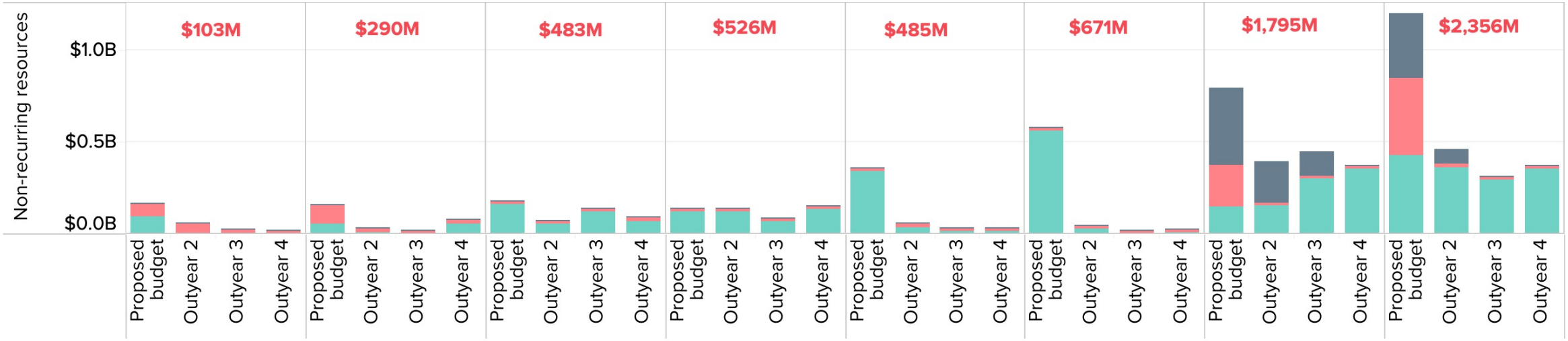
Public transportation: The need to travel downtown has shaped public transportation.

All are closely tied to District's key revenue sources: sales, property, and income taxes.

THE BUDGET PROPOSAL BETS ON ECONOMIC GROWTH



Proposed gap coverage



Federal funds
Other transfers
Previous savings

Source: D.C. OCFO Budget Books.
Note: The plannned spending includes spending approved by the Council for Fiscal Years 2016 through 2022 for the budget year and the financial plan period. The recurring revenue includes revenue proposals adopted by the Council for the same period. The proposed spending t for FY 2023 through FY 2026 Budget and Financial Plan is Mayor's proposal. Federal funds = $800M in FY 2022 proposal and $400M in FY 2023 proposal.

WHAT WE KNOW:

- There is a growing preference for remote work.

WHAT WE DON'T KNOW:

- How many workers will shift to a permanent remote or hybrid work arrangements?
- To what extent will remote work alter where workers prefer to live?
- What will be the long-run equilibrium?

WHAT WE CAN DO:

- We can use pre-pandemic data to begin to estimate how a shift to telework will impact the city's revenue streams
- While the city doesn't have the power to change worker preferences, understanding the impact of remote work will allow the city to 1) adapt to how demand for the city's space is changing and 2) maximize future revenue under changing conditions.

02 WHAT OTHERS HAVE FOUND (SEE ATTACHED READING LIST)

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EXISTING STUDIES ESTIMATE HOW TELEWORK WILL ALTER BEHAVIOR, PREFERENCES, AND FUTURE ECONOMIC TRAJECTORIES ACROSS DIFFERENT ENVIRONMENTS

Studies can be loosely grouped into five areas:

1. Labor demand and work environment
2. Competitiveness, attractiveness of cities
3. Housing markets
4. Office demand
5. Public transportation

LABOR DEMAND AND WORK ENVIRONMENT

There will be a shift to remote work.

- Researchers predict most office workers will only work on site two to three days a week. Prior to the pandemic, only 5 percent of workers were remote.
- In mid-2021, 36 percent of remote workers indicated that if they were forced to go back to the office, they would quit.

Remote work is most common in industries with better pay & highly educated workers.

- That is our region: Researchers estimate that 37 percent of jobs in the U.S. can be performed at home, compared to 51 percent in the Washington metropolitan area.

Job postings and skills demanded by employers reflect these trends.

- The share of job postings advertising telework more than tripled during the pandemic.
- Employers are demanding telework friendly skillsets, such as time management, self-motivation, and strong communication.
- Despite concerns surrounding remote work (reduced collaboration, corporate identity, and knowledge sharing), managers believe offering remote work flexibility is key to talent attraction and retention in the future.

COMPETITIVENESS AND ATTRACTIVENESS IN CITIES

Nationally, high-cost urban areas with educated workers have higher levels of exodus.

- **U-Haul data**: More than 10 percent of moves between April 2020-May 2021 were influenced by COVID-19, with a significant shift in migration toward smaller cities, lower cost of living locations, lower tax locales, and locations with fewer pandemic-related restrictions. Higher income households are moving out at greater rates and are moving more for lifestyle reasons and less for work-related reasons.

Various data sources confirm that this trend was observed the D.C. region as well.

- **Census data:** D.C. lost nearly 20,000 residents between April 1, 2020, and July 1, 2021.
- **Credit card data:** Washington metro region saw a 6.7 percent increase in moves to lower cost metro areas with similar populations (>2 million), 8.1 percent increase in moves to mid-sized metro areas, and 12 percent increase in moves to areas with much small populations.
- **Employment data:** D.C. no longer the main driver of job growth in the region.
- **Address change data:** US Postal Service combined with Zillow data show that within large US cities, households and businesses have moved from the dense central business districts (CBDs) toward lower density suburban zip-codes—the Donut Effect. For DC, ORA data show an increase in permanent moves for residents, with return in the summer of 2021. Similarly, 3 percent in business establishments left DC within the first few months of the pandemic.

This will have domino effects on retailers that support office workers, local service industries, and thus, the tax base.

PUBLIC TRANSPORTATION

The loss of commuters has hit public transportation revenues hard, and if remote work continues, the structure, funding, and operations of public transit systems must change.

- WMATA will have an estimated budget shortfall of $500 million beginning with the summer of 2023.
- Unfortunately, fare-free systems have not really helped increase ridership.

There have been disparate impacts on the ridership across different socioeconomic groups.

- If this continues, there would also be an impact on rider profile, with higher paid, higher education riders using public transportation less often. This has a multitude of implications and could impact public support for investment in the metro system.

However, many residents in essential jobs and low-income residents still rely on public transportation, so these services remain essential.

DEMAND FOR HOUSING

There is a close connection between jobs and housing – more jobs result in more residents. However, the pandemic is starting to change this connection as commute times become less important.

- Zillow data show that housing appreciation was much stronger for exurbs compared to D.C., Arlington, Fairfax, Montgomery, and Prince George's counties.

Housing demand is increasing faster in less dense neighborhoods and neighborhoods farther from the center of metro areas.

- Households are adapting to changing conditions and their expectations of what work will look like.

The key will be to sort out the short-term and long-term responses.

- One study shows the series of shocks that affected U.S. housing markets in 2020 with large movements in prices, inventories, rents. But: while these impacts were large, the dynamic of prices is consistent with the market's expectations of resilience.
- Historic examples of short-term shocks to show that many urban jurisdictions rapidly recover. Urban growth trends are more closely tied to fundamentals such as education, industrial specialization, industrial diversification, urban segregation, and housing supply elasticity, and not short-term shocks.

OFFICE DEMAND

Office vacancy in D.C. hit historic highs, pushing 20 percent. In the future, there will likely be large shifts in density, if not in demand for office space.

- Monthly surveys show that employers will likely cut days on site by 30 percent or more and, on average, office space will be cut by 1 to 2 percent.

On the bright side, leasing activity is picking up.

- CBRE and Colliers have found that leasing activity is concentrated in smaller leases of 20,000 to 50,000 square feet, and that there has been a more diverse set of companies signing leases.

However, the shifts in the market have still largely impacted D.C. commercial tax revenue.

- Already, by the end of the first year of the pandemic, there was a 9 percent decline in assessed values of large commercial office buildings, costing the city over $150 million in annual tax revenue (based on December 2020 revenue estimates published by the Chief Financial Officer).
- Downtown DC lost $5B in value.
- Office buildings in mixed-use neighborhoods held on to their values.
- Another shoe to drop? Cap rates

03A THE GEOGRAPHY OF WORK

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D.C. HIGHLY DEPENDENT ON COMMUTER ACTIVITY

Among D.C's workforce:

70%

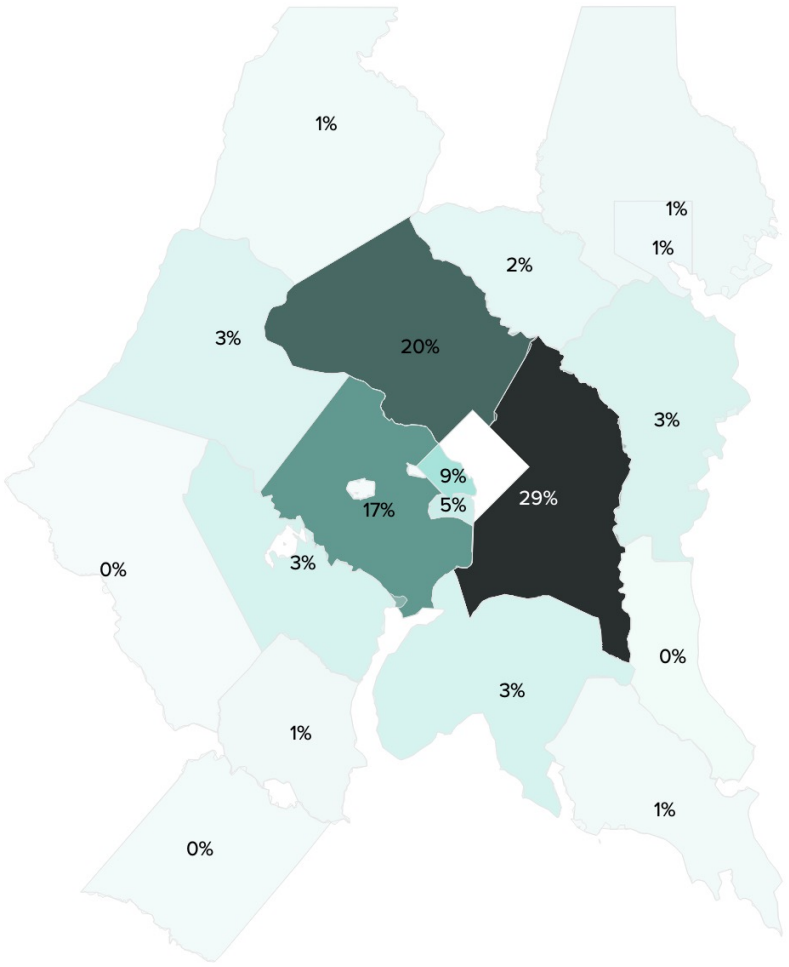
Live in another jurisdiction (444K workers)

Among these workers:

86%
Live in the MSA

14%
Live outside the MSA

Commuters to D.C. by county (2019)

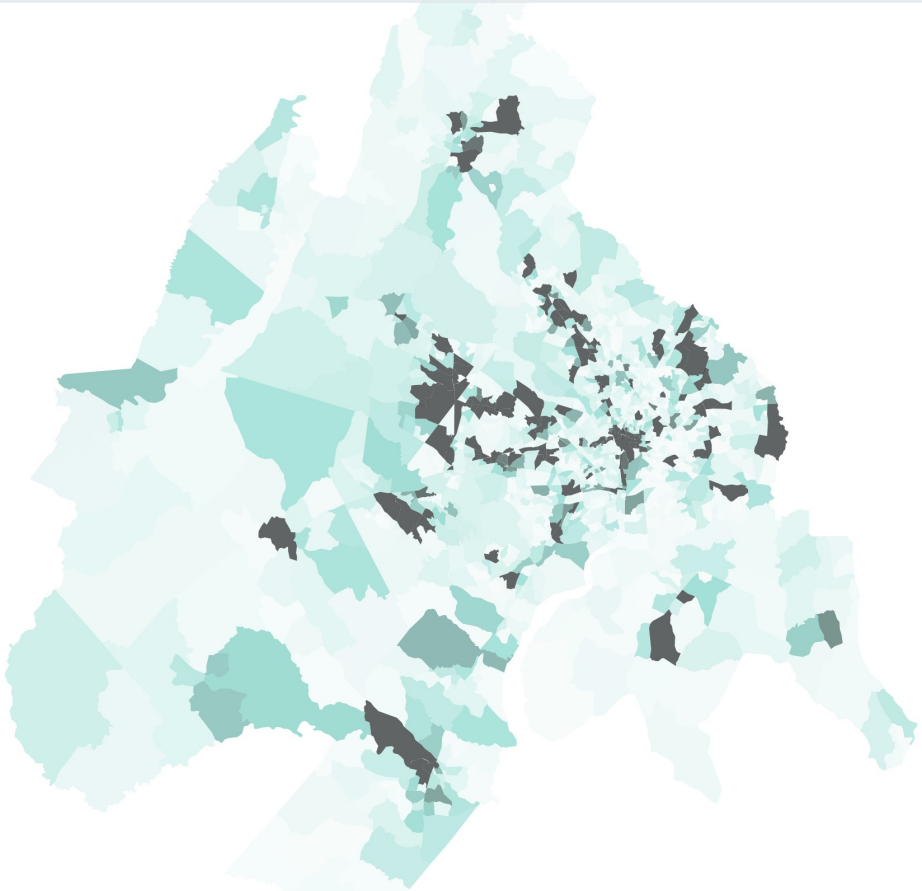


Source: U.S. Census Bureau LEHD Origin-Destination Employment Statistics Data (2019)

DAYTIME ECONOMIC ACTIVITY WAS CONCENTRATED ALONG THE REGION'S TRANSPORTATION LINES

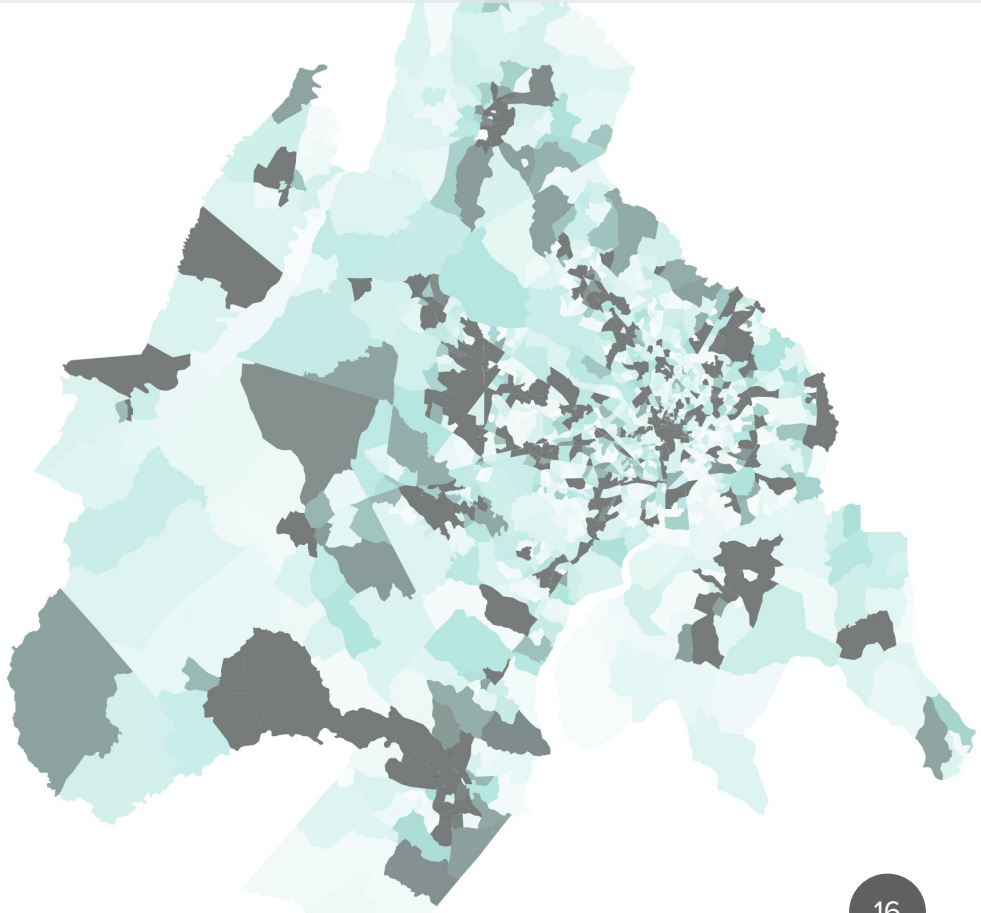
Where workers work: Remote eligible jobs

~2.29 million workers in the MSA hold jobs that *can* be done from home



Where workers work: In-person jobs

~4.19 million residents in the MSA hold jobs that *cannot* be done from home



Source: Dingel, Jonathan, and Brent Neiman (2020).+ LEHD Origin-Destination Employment Statistics Data (2019)

FOR POTENTIALLY 2.3 MILLION WORKERS, THE RELATIONSHIP BETWEEN WHERE THEY LIVE AND WHERE THEY WORK IS BECOMING WEAKER

- Researchers at the Becker-Freidman Institute for Economics at the University of Chicago estimate that 51% of all jobs in the D.C. metropolitan area can be done at home.
- This compares to a national average of 37%.
- This is in part driven by the region's high share of workers with a Bachelor's degree or higher.

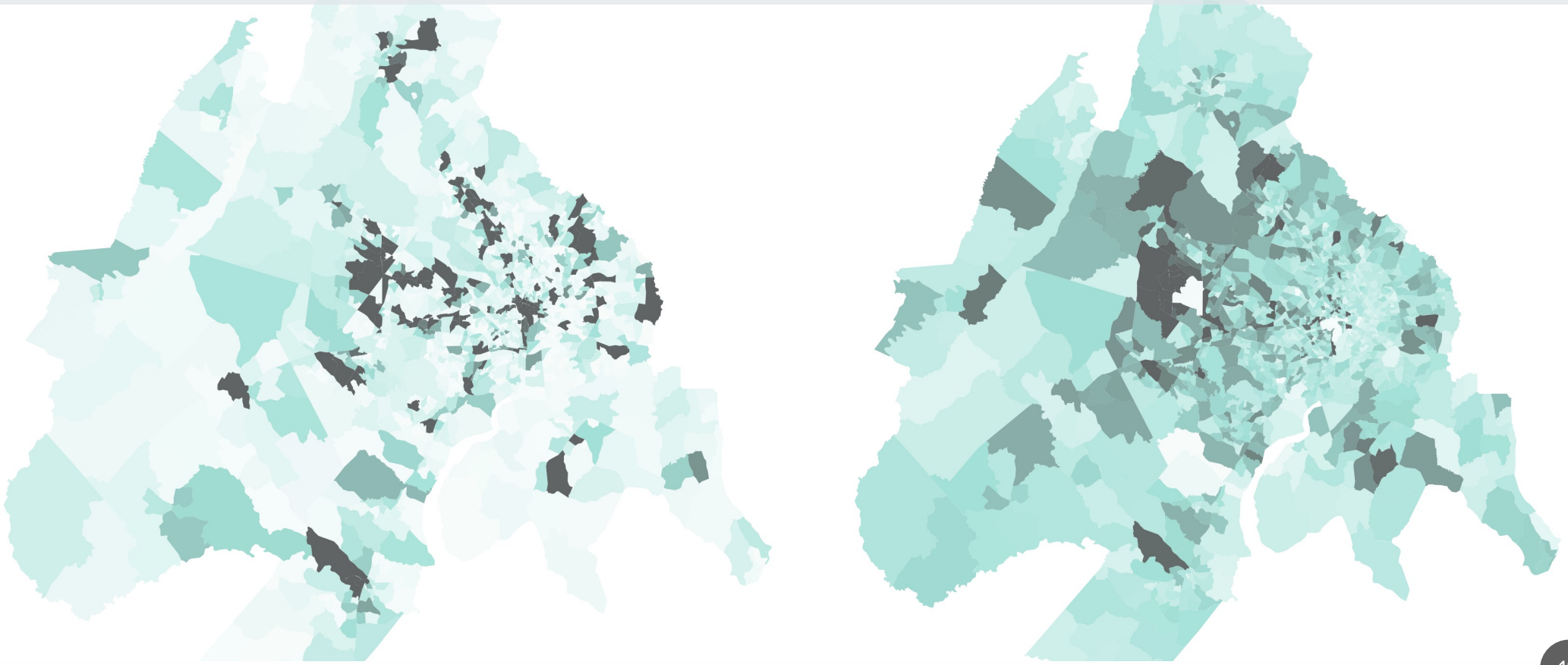
Industry	Share of jobs that can be done from home
Agriculture, Forestry, Fishing and Hunting	8%
Mining, Quarrying, and Oil and Gas Extraction	25%
Utilities	37%
Construction	19%
Manufacturing	22%
Wholesale Trade	52%
Retail Trade	14%
Transportation and Warehousing	19%
Information	72%
Finance and Insurance	76%
Real Estate and Rental and Leasing	42%
Professional, Scientific, and Technical Services	80%
Management of Companies and Enterprises	79%
Administrative and Support	31%
Educational Services	83%
Health Care and Social Assistance	25%
Arts, Entertainment, and Recreation	30%
Accommodation and Food Services	4%
Other Services (except Public Administration)	31%
Federal, State, and Local Government	41%

Source: Dingel, Jonathan, and Brent Neiman (2020).+ LEHD Origin-Destination Employment Statistics Data (2019). Note: In our calculations we exclude jobs in education services. See appendix for more detail.

DAYTIME ECONOMIC ACTIVITY COULD SHIFT TO WHERE OFFICE WORKERS LIVE

Remote eligible jobs - ~2.26 million residents in the MSA hold jobs that *can* be done from home

Pre-pandemic geography of work		**Post-pandemic geography of work?**
Where workers work	→	*Where workers live*



Source: Dingel, Jonathan, and Brent Neiman (2020).+ LEHD Origin-Destination Employment Statistics Data (2019)

IN D.C., ECONOMIC ACTIVITY COULD SHIFT FROM DOWNTOWN TO MIXED-USE AND UNIVERSITY NEIGHBORHOODS.

245,000 D.C. jobs can be worked remotely. Only **110,000** D.C. residents have remotely workable jobs.

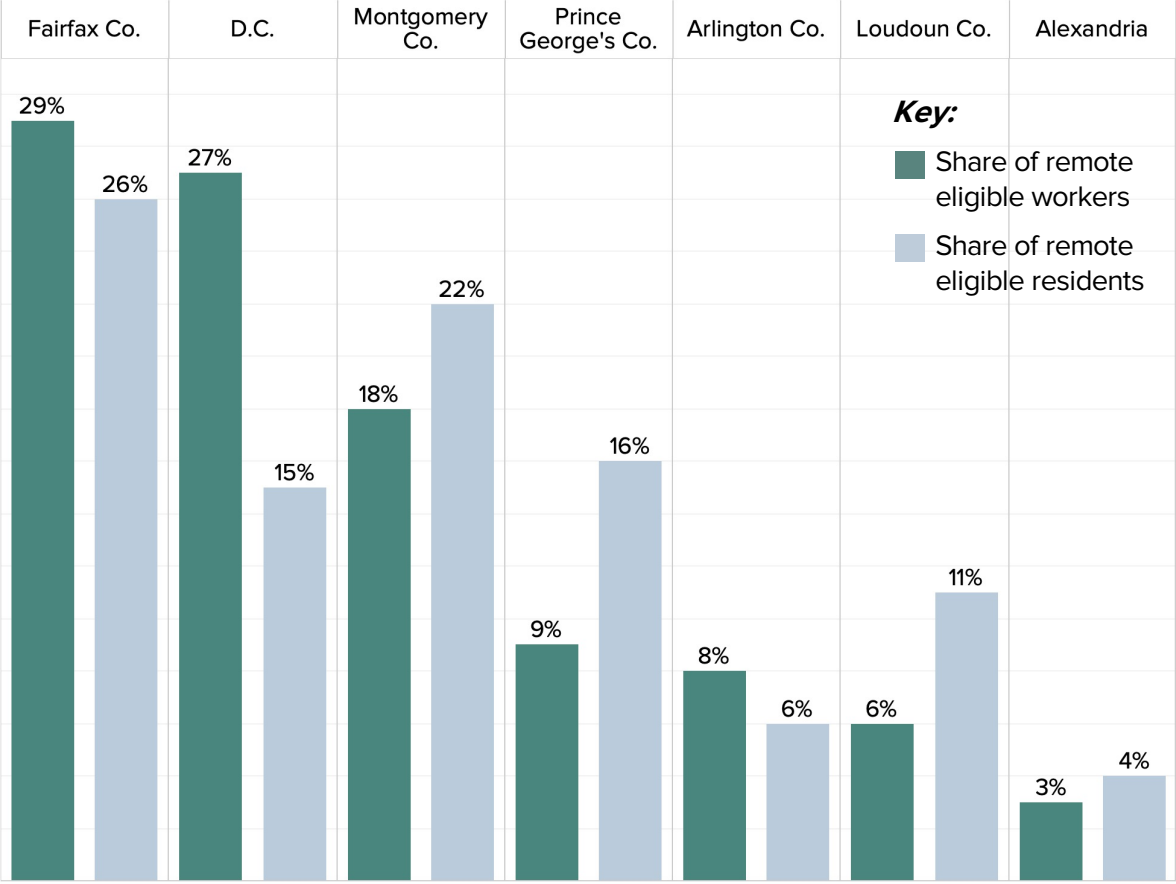
Pre-pandemic geography of work
Where workers work

Post-pandemic geography of work?
Where workers live

Source: Dingel, Jonathan, and Brent Neiman (2020).+ LEHD Origin-Destination Employment Statistics Data (2019)

COMMUTER FOOTPRINT IN D.C. IS MUCH LARGER THAN RESIDENT EMPLOYMENT FOOTPRINT

Distribution of residents and workers with remote eligible jobs among the core counties



Count of residents and workers with remote eligible jobs among the core counties

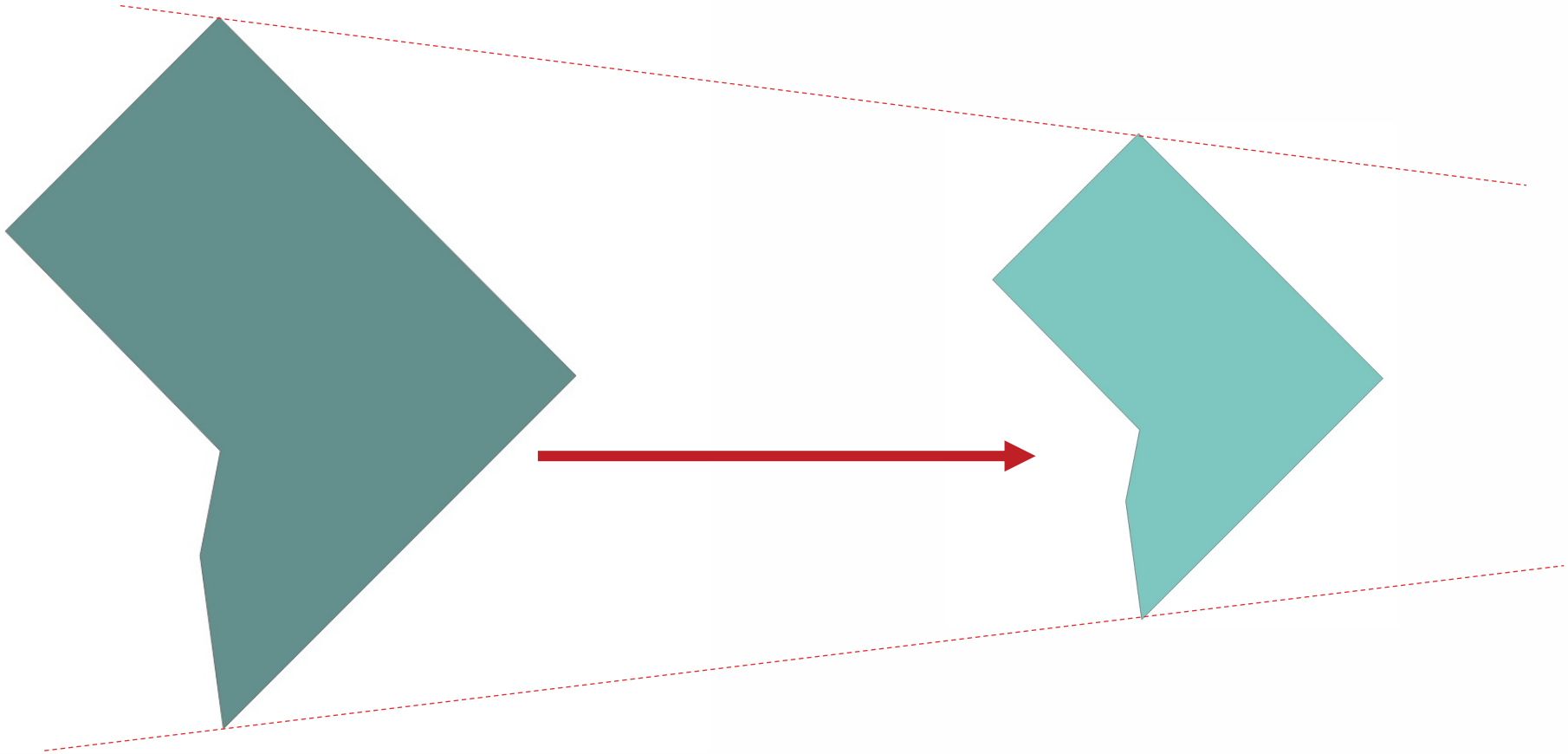
County	Total workers in remote eligible jobs	Total residents in remote eligible jobs
D.C.	245,172	110,967
Prince George's Co.	80,582	123,272
Montgomery Co.	164,284	163,208
Arlington Co.	70,136	47,874
Fairfax Co.	265,653	197,012
Loudoun Co.	50,598	81,501
Alexandria	31,305	27,421

Source: Dingel, Jonathan, and Brent Neiman (2020).+ LEHD Origin-Destination Employment Statistics Data (2019)

UP TO 45 PERCENT DECLINE IN WORKER FOOTPRINT

Pre-pandemic geography of work

Post-pandemic geography of work?



Source: Dingel, Jonathan, and Brent Neiman (2020).+ LEHD Origin-Destination Employment Statistics Data (2019)

IF OFFICE WORKERS SHIFT TO A PERMANENT REMOTE OR HYBRID WORK ARRANGEMENT, HOW MANY COMMUTERS WILL D.C. LOSE?

How many workers commuted to D.C. prior to the pandemic?

401,481 *

How many of these workers can do their jobs from home?

155,550 **

*Excludes 5% of workers to account for those that were fully remote pre-pandemic. Includes only commuters from Virginia or Maryland, assuming workers that live further away did not commute regularly prior to the pandemic. Includes primary jobs across all industries.

*Calculated by applying the share of jobs that can be done from home by industry as estimated by University of Chicago researchers to PUMS data (filtering for those with a place of work in D.C. and residence in Virginia or Maryland). Then we applied the share of commuters that can do their jobs from home as estimated by PUMS data to the commuters as estimated by LODES data: (198,309/512,009) * 401,481. Excludes education jobs due to lack of data.

Source: Dingel, Jonathan, and Brent Neiman (2020).+ LEHD Origin-Destination Employment Statistics Data (2019).+ U.S. Census Bureau ACS, 1-year PUMS data (2019). Note: Excludes education jobs, see appendix for more details.

03B THE FUTURE OF WORK?

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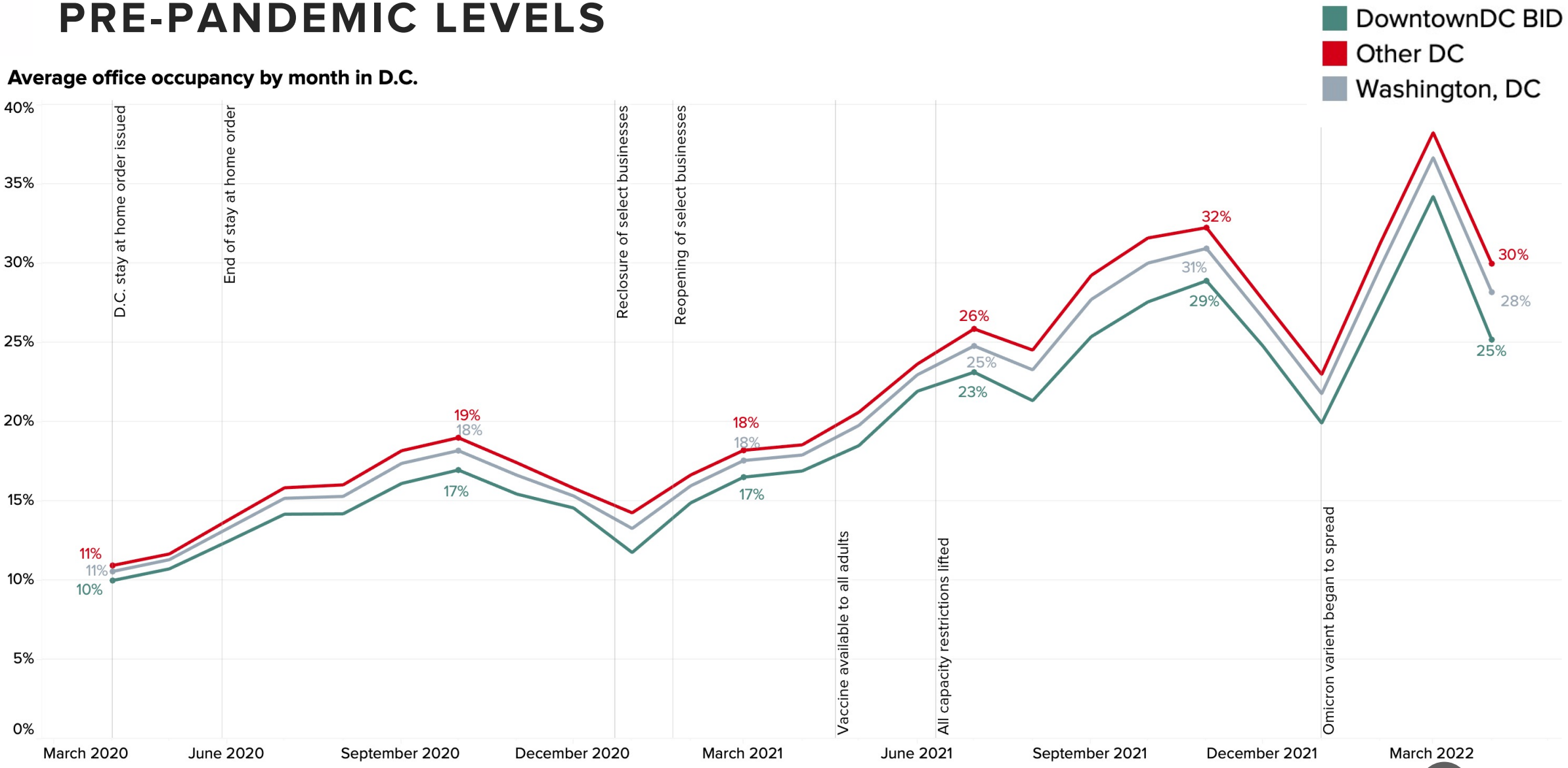
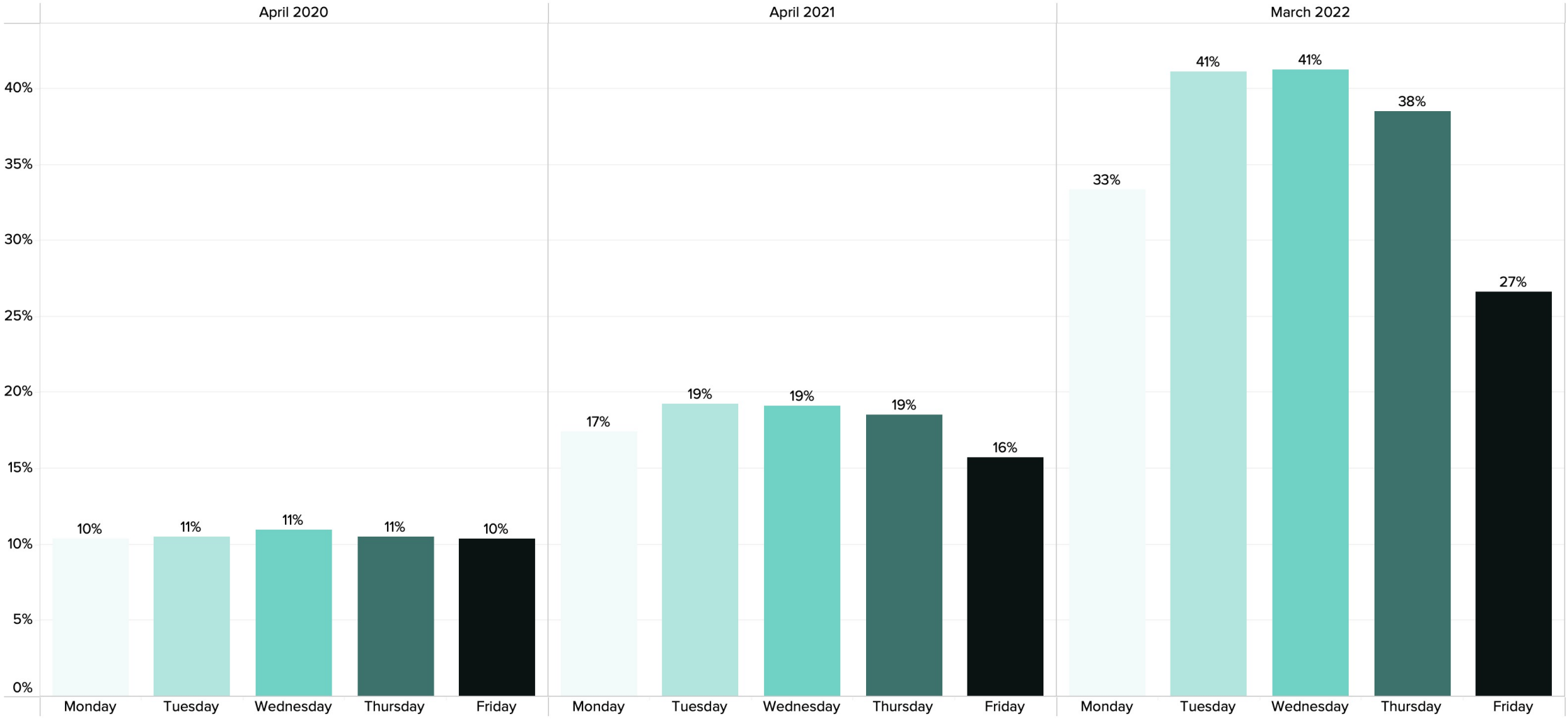
OFFICE OCCUPANCY IS IMPROVING BUT STILL MUCH BELOW PRE-PANDEMIC LEVELS



Source: Kastle Data Systems

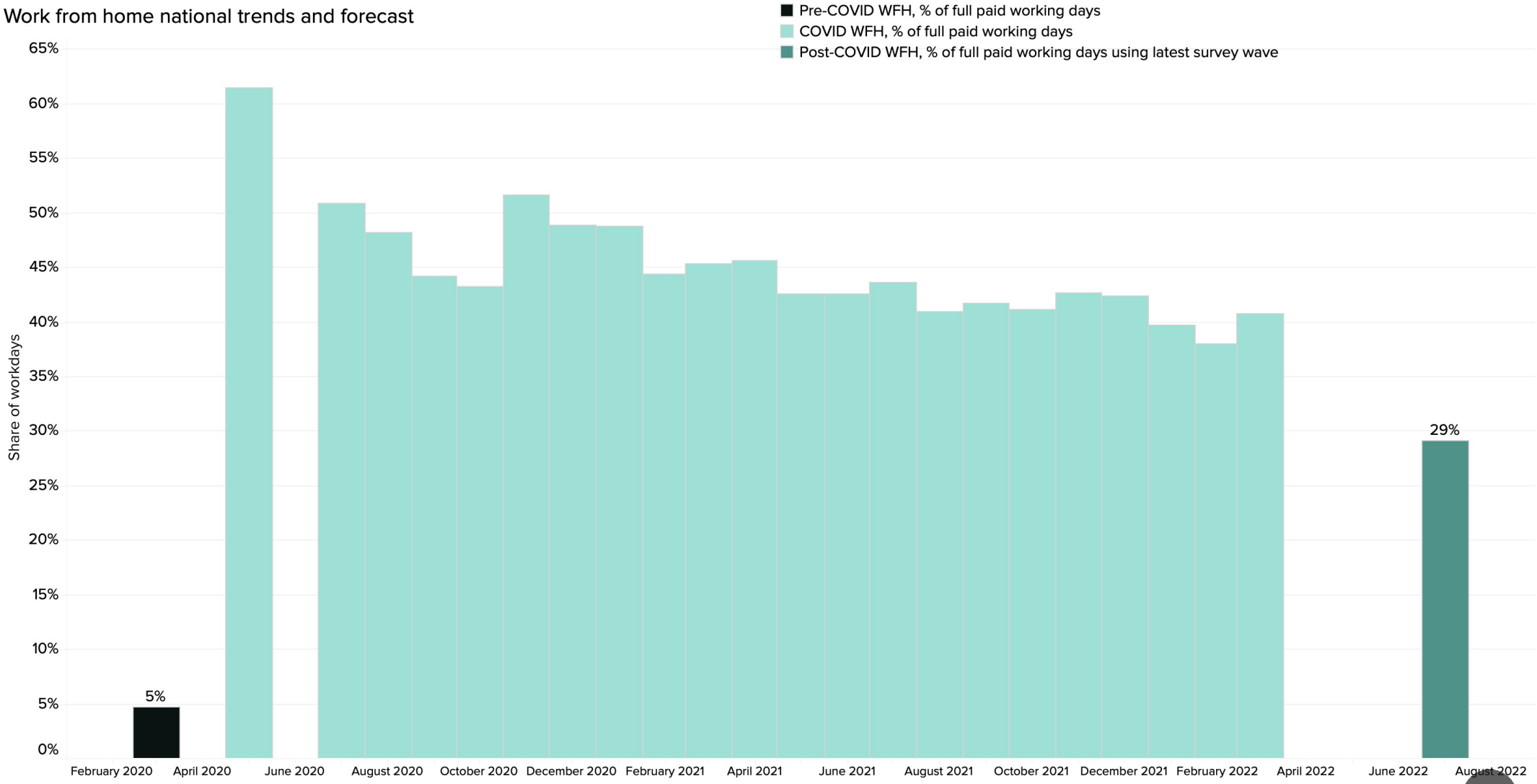
HYBRID WORK PREFERENCES ARE SLOWLY EMERGING

Average office occupany by day of the week in D.C.



Source: Kastle Data Systems

NATIONAL SURVEYS PREDICT 30 PERCENT OF WORKDAYS WILL BE WORKED FROM HOME

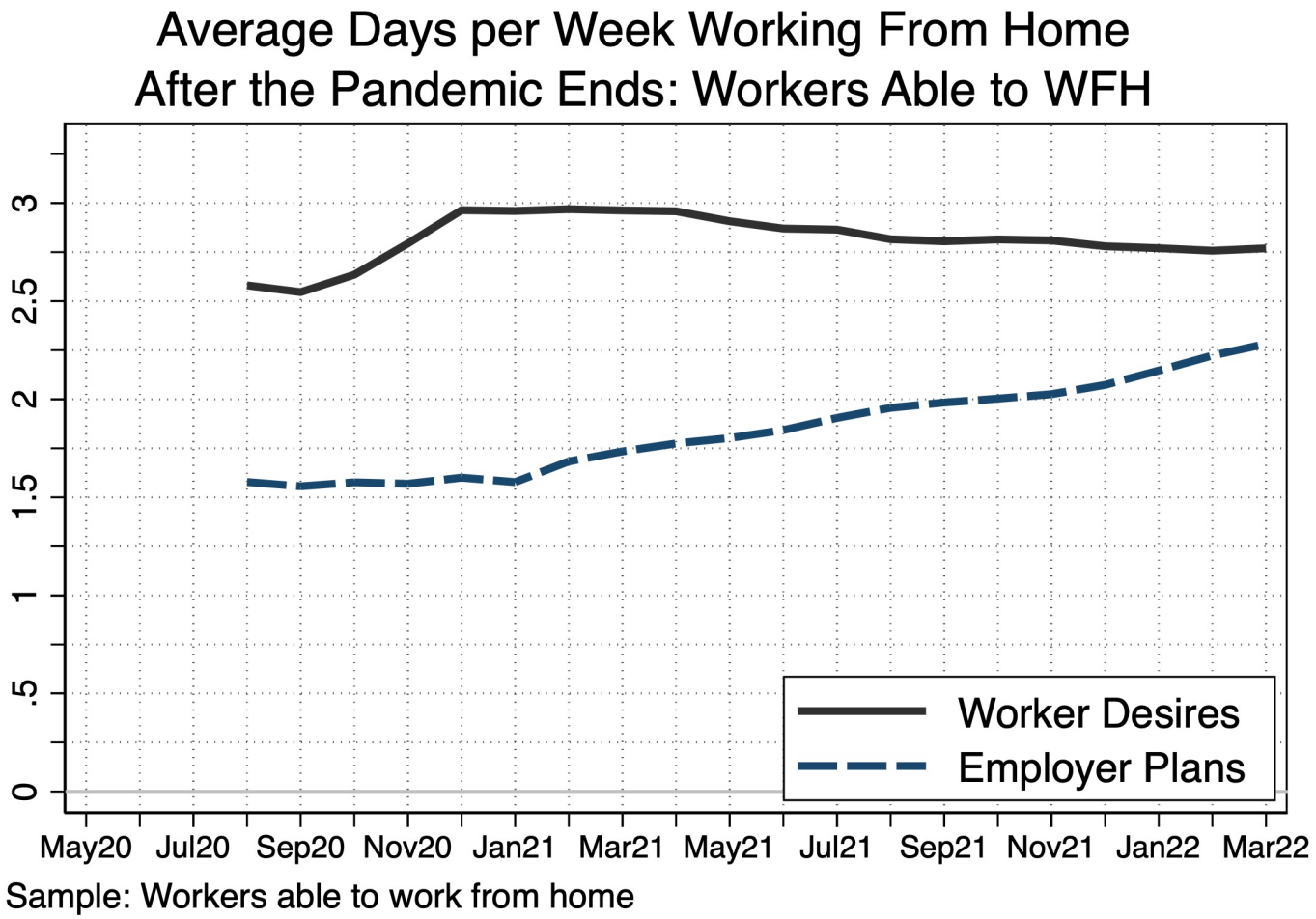


EMPLOYERS AND WORKERS DIVERGE IN THEIR PREFERRED NUMBER OF IN-OFFICE WORKDAYS

- Employers want workers to come in three days a week.
- Employees want to come in two days a week.
- Responses to the questions:

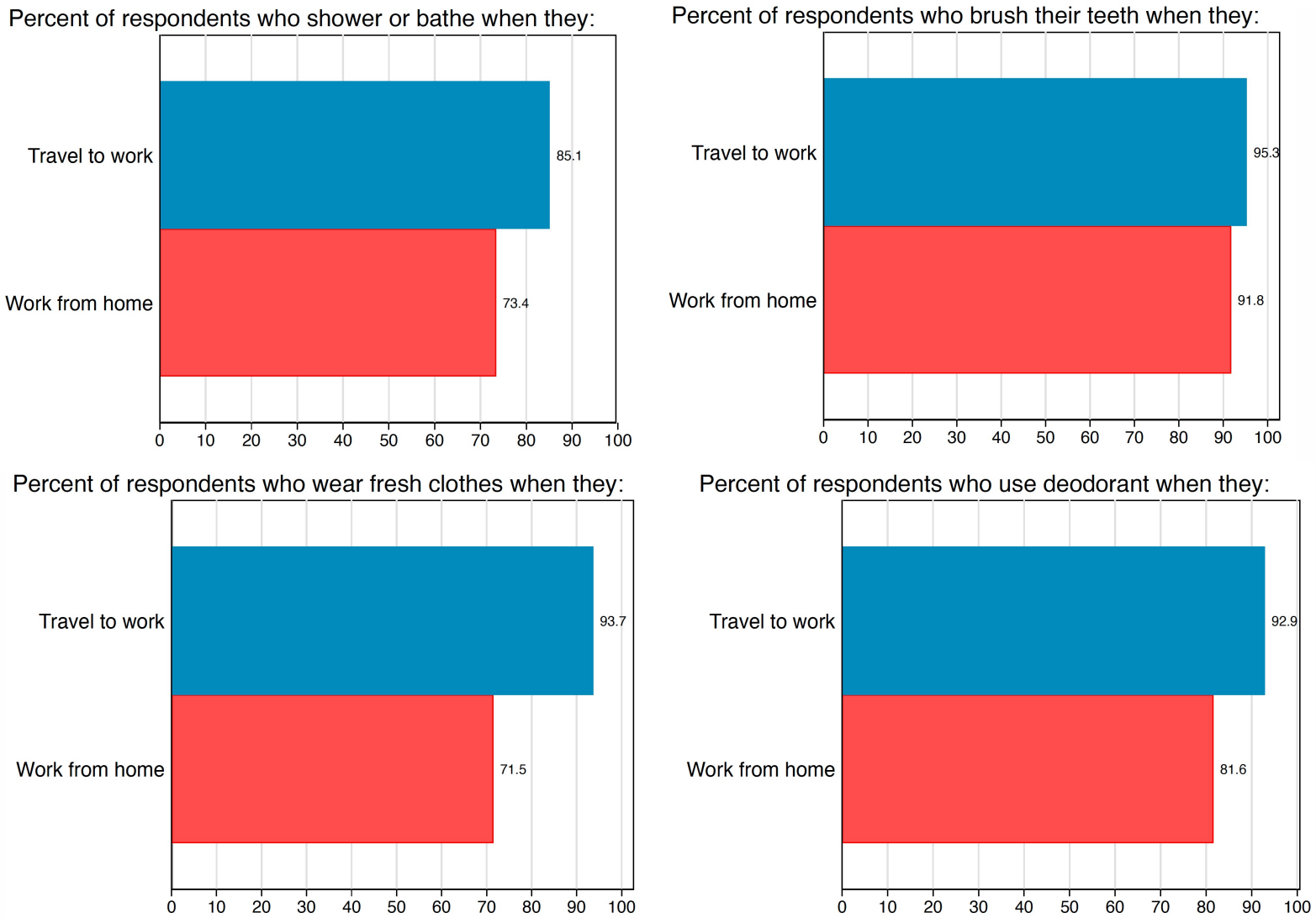
(1) After the pandemic ends, how often would you like to have full paid days at home?

(2) After the pandemic ends, how often is your employer planning for you to work full days at home?



Source: Copyright 2022 by Jose Maria Barrero, Nicholas Bloom, and Steven J. Davis.

THOSE WHO WORK FROM HOME ARE CHANGING ALL KINDS OF BEHAVIOR



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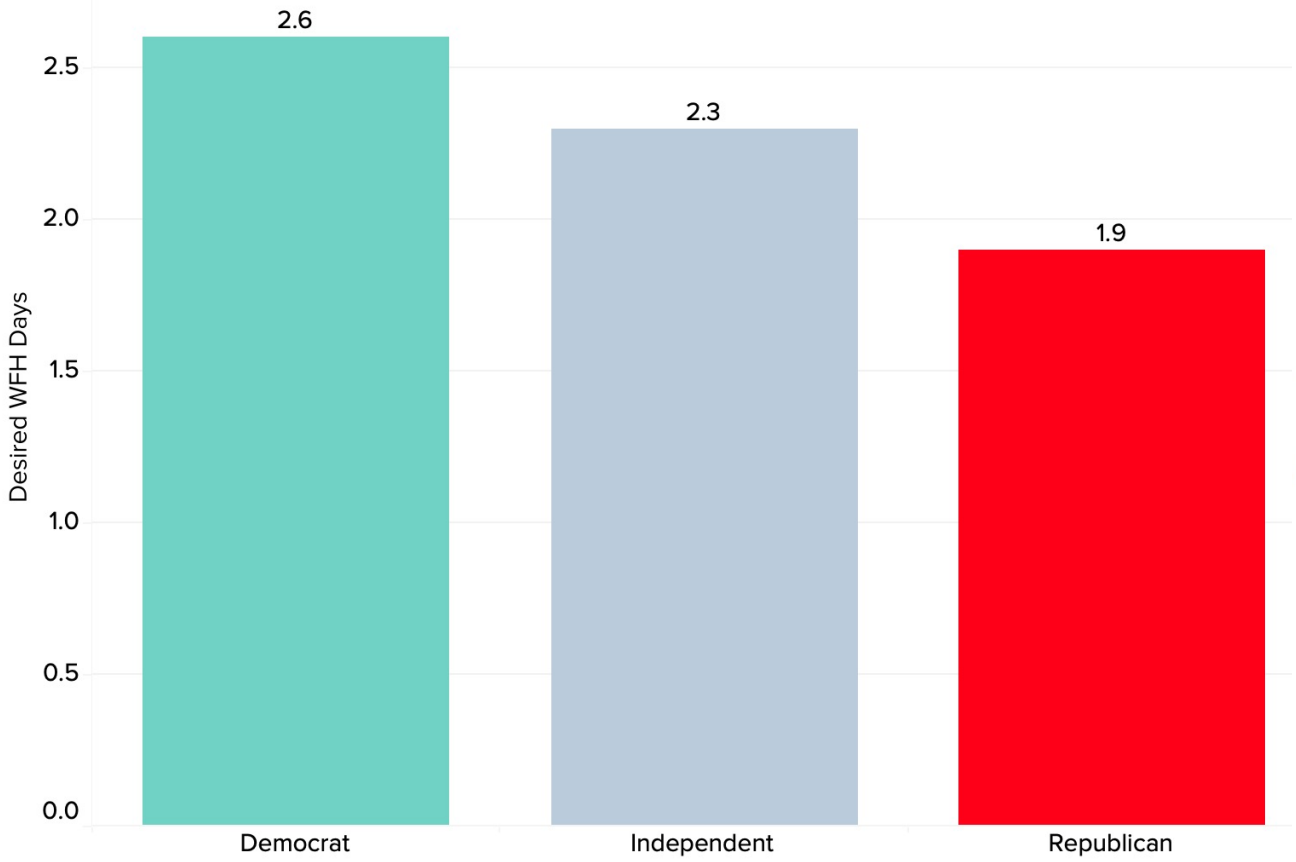
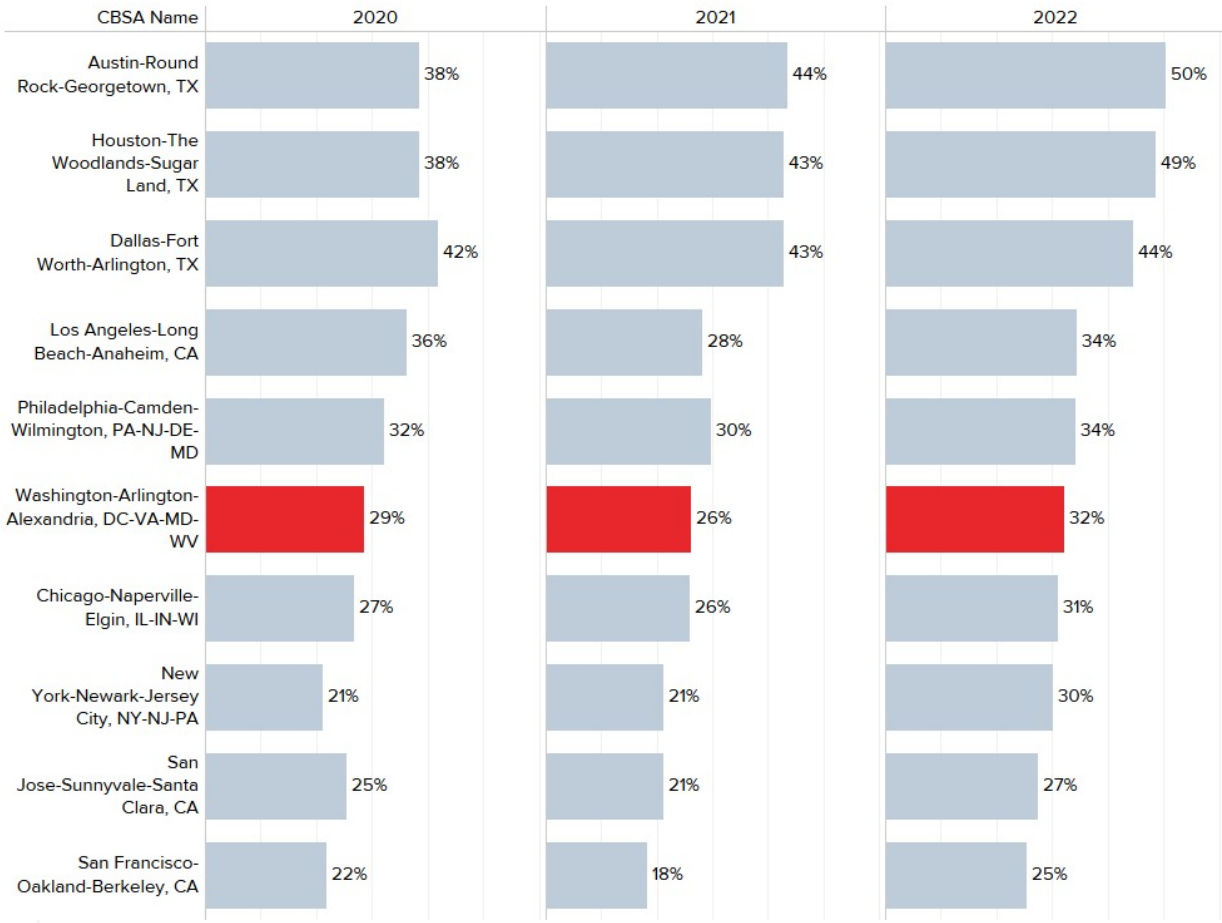
WORKERS MORE LIKELY TO WORK FROM HOME IN EXPENSIVE METRO AREAS AND IF THEY ARE DEMOCRATS

Worker preferences by political party affiliation

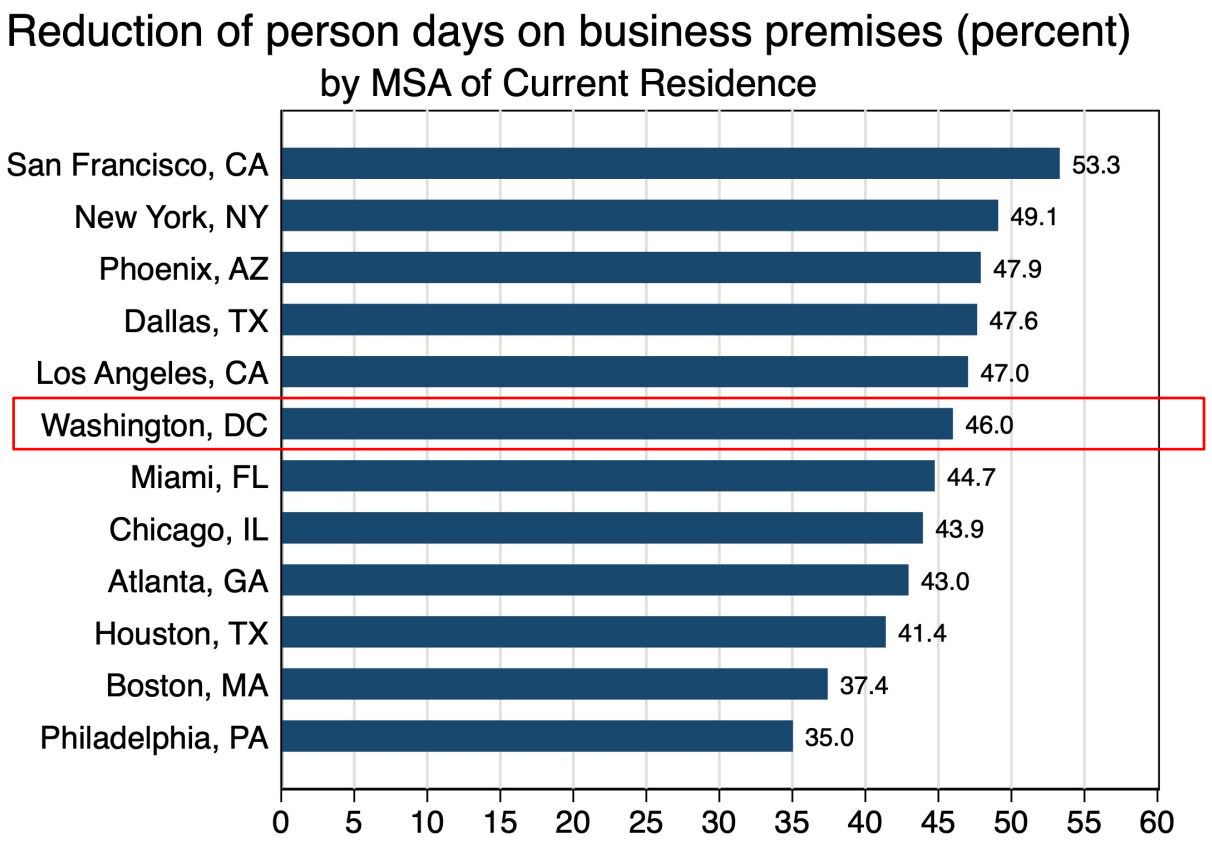


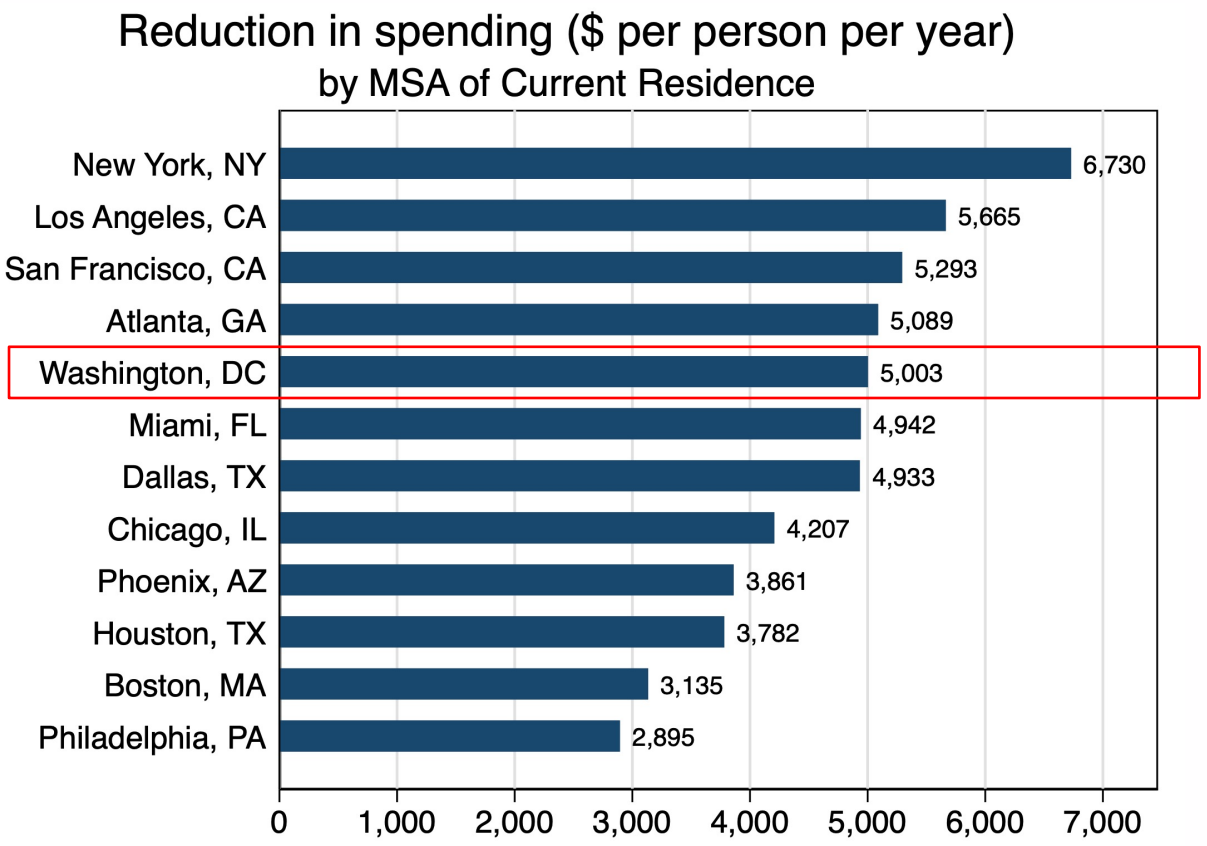
Average office occupancy in the top ten CBSAs



Source: Copyright 2022 by Jose Maria Barrero, Nicholas Bloom, and Steven J. Davis.

FEWER WORKERS IN OFFICE MEAN FEWER $$ SPENT NEAR WORK





Source: Copyright 2022 by Jose Maria Barrero, Nicholas Bloom, and Steven J. Davis.

04 IMPACTS ON THE TAX BASE

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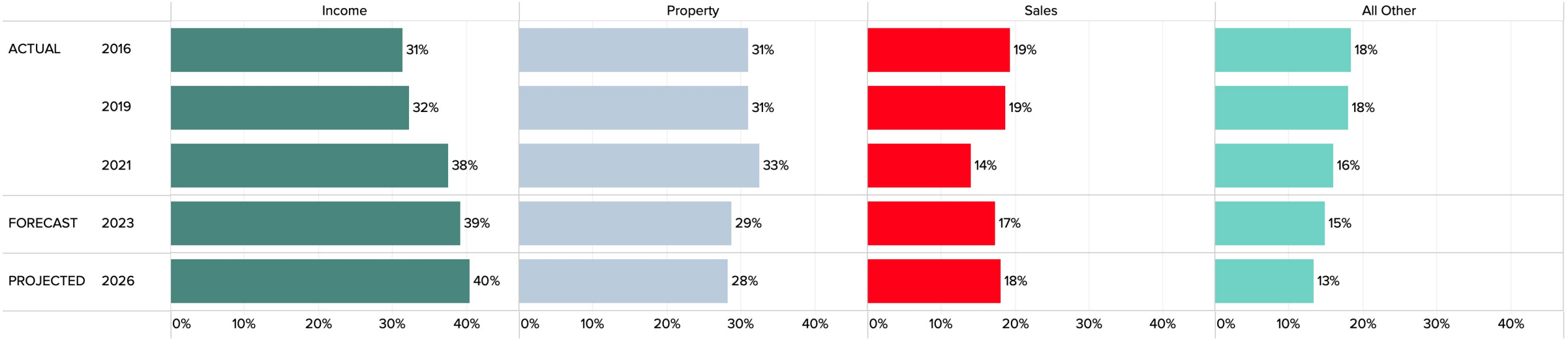
BOTH ACTUAL REVENUE AND REVENUE FORECAST INDICATE INCREASING RELIANCE ON INCOME TAXES

Sources of Local Fund Revenue (Gross)

FY 2016, 2019: No pandemic
FY 2021: Pandemic
FY 2023, FY 2026: Post pandemic



Source: D.C. OCFO Revenue Chapters, various years.
Note: All other include gross receipts, non tax revenue, lottery transfer, and other types of taxes (deed, economic interest, and estate).

REMOTE WORK-RELATED RISKS EXIST FOR ALL BASES

Source	Type	Downward Pressure from Remote Work	Upward Pressure from Remote work	Forecast projection	Inflation adjusted
Property	Commercial Property	• Increased vacancy will reduce NOI • Increased cap rates will reduce asset values	• Lower rents could attract new types of businesses		
	Residential Property	• Exodus to suburbia can impede housing demand	• Desire to live close to work can increase housing demand		
	All property			+7%	-2%
Sales	General Sales	• Loss of sales in high tax bases (restaurants, hotels, parking)	• Increased sales in low tax bases	+14%	+5%
Income	Individual Income	• Domestic outmigration erodes tax paying households	• Higher income households replace lower income households	+14%	+4%
Income	Corporate Franchise	• Fewer corporations relocating to D.C. to follow their workers	• More corporations relocating to D.C. to take advantage of lower rents	+9%	-1%
Income	U.B. Franchise	• Fewer UBs stay are formed or remain in D.C.		-8%	-15%
Other	Deed Recordation &Transfer	• Less interest in D.C. from REITs • Fewer large building transactions.		-6%	-14%
Nontax	Licenses & Permits	• Less construction, fewer business applications		+1%	-8%
Nontax	Fines & Forfeits	• Less traffic, less street parking	• Alternative use of public space?	-5%	-13%
ALL LOCAL REVENUE CHANGE FROM FY 2023 to FY 2026				+9%	0%

04A GENERAL SALES TAX

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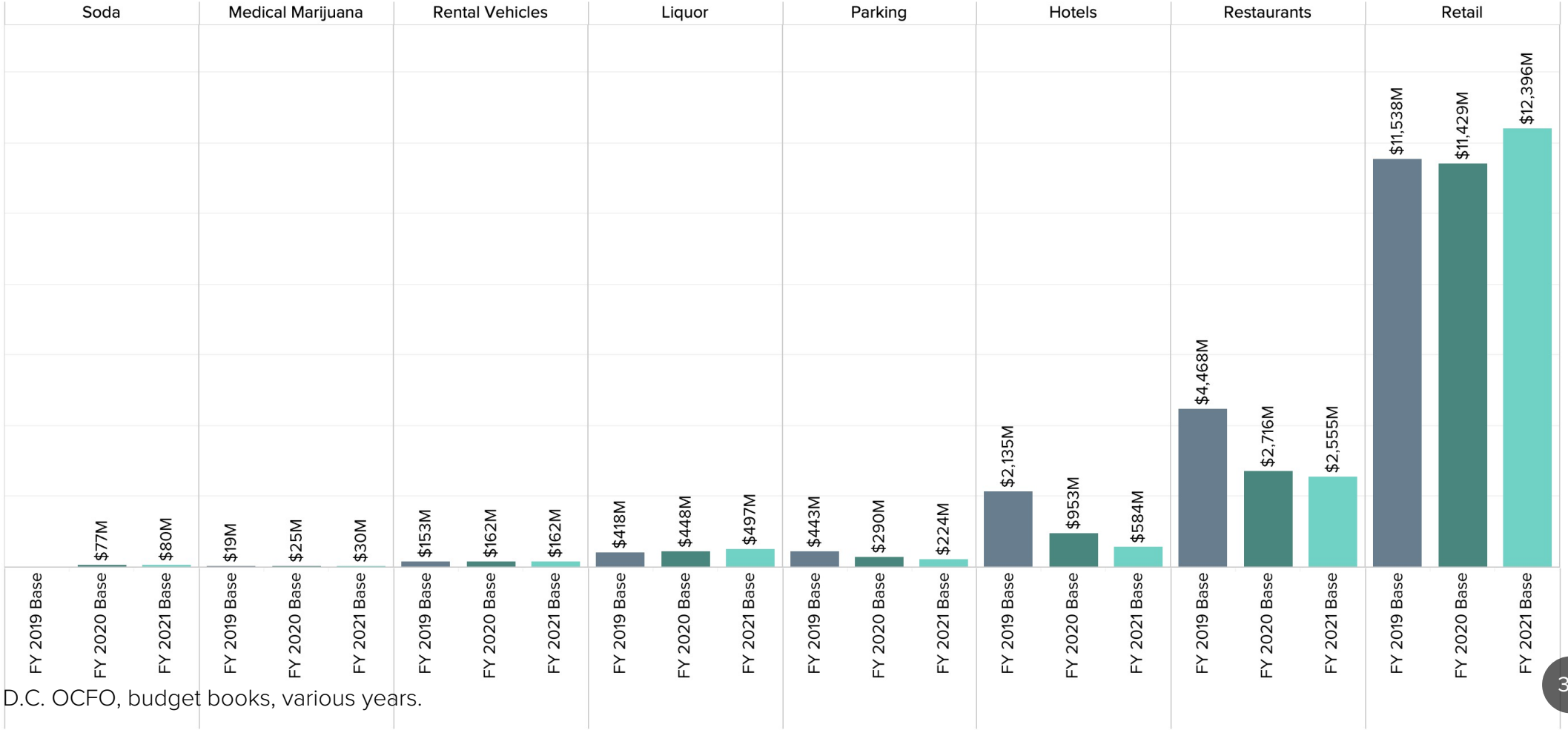
WITH FEWER COMMUTERS AND TOURISTS GENERAL SALES ACTIVITY SHIFTED FROM HIGH-TAX TO LOW-TAX BASE

General Sales Tax Base

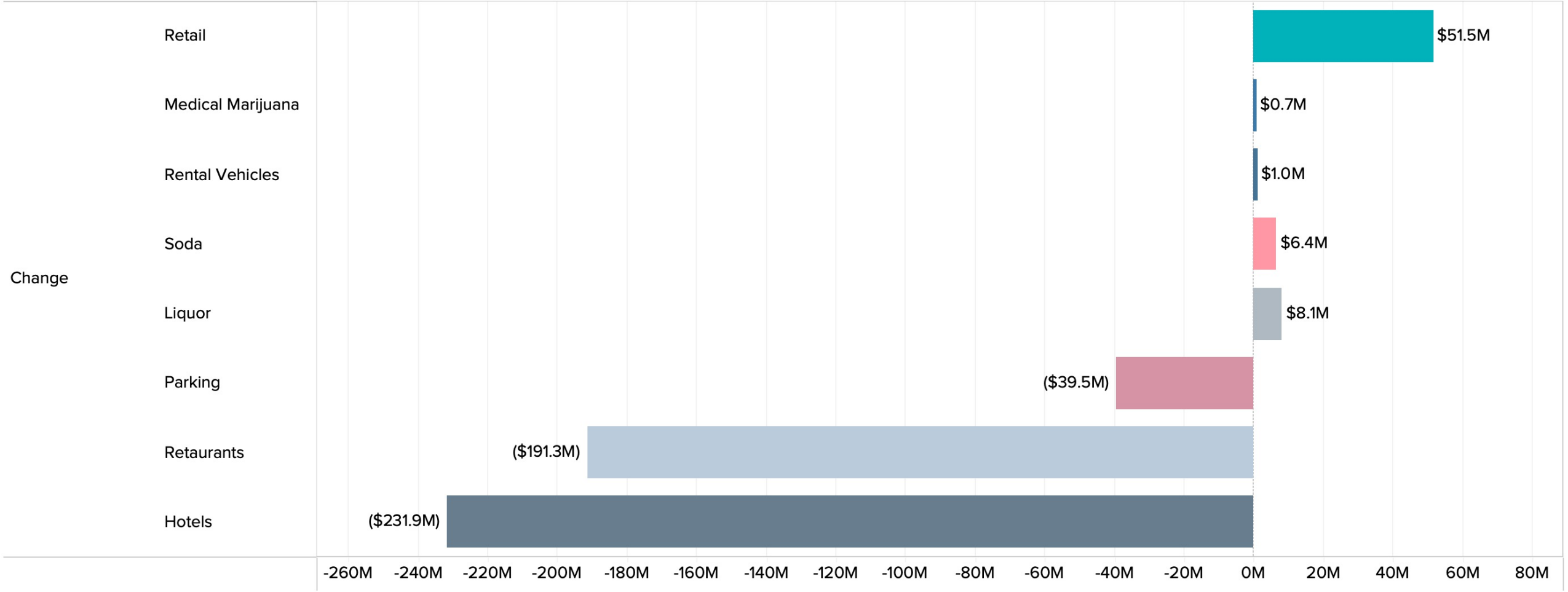
FY 2019 - no pandemic
FY 2020 - 6 months of pandemic
FY 2021 - full pandemic



Source: D.C. OCFO, budget books, various years.

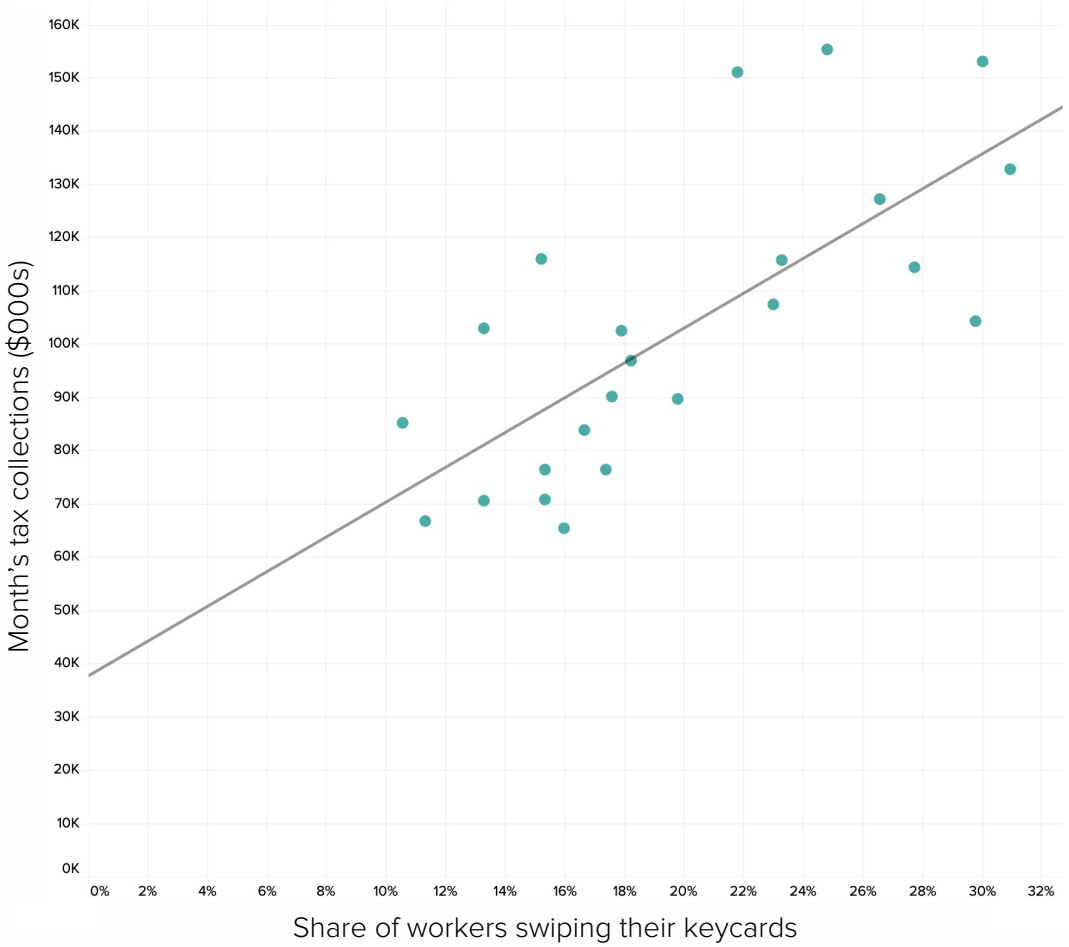
HOW MUCH OF THIS CAN BE ATTRIBUTED TO REMOTE WORK?

General Sales Tax Revenue
Change from 2019 to 2021



STRONG RELATIONSHIP BETWEEN OFFICE OCCUPANCY AND GENERAL SALES TAX

Relationship between sales tax collections and office occupancy in D.C.



R-Squared:	0.530205
Standard error:	19394.4
p-value (significance):	< 0.0001

Term	Value	StdErr	t-value	p-value
D.C. occupancy	**326,999**	67,169	4.8683	< 0.0001
intercept	37,650.9	13,908.5	2.70703	0.0132023

Source: D.C. OCFO Cash reports and Kastle data.

WHAT HAPPENS TO SALES TAX IS THEN CLOSELY ASSOCIATED WITH REMOTE WORK HABITS

How many days per week will office workers continue work from home post-pandemic?

3 days	2 days	1 days
High estimate, based on worker preferences	Moderate estimate, based on employer preferences	Low estimate, based on the lowest estimate from researchers

For those that work in D.C. and live elsewhere, this is equivalent to a…

60%	40%	20%
Reduction in time spent in D.C. on weekdays	Reduction in time spent in D.C. on weekdays	Reduction in time spent in D.C. on weekdays

Source: D.C. Policy Center estimates, using data provided by "Copyright 2022 by Jose Maria Barrero, Nicholas Bloom, and Steven J. Davis." Note: Assumes all workers will be hybrid, or in effect, the workers that choose to be fully in-person and the workers that choose to be fully remote will cancel out.

TO CALCULATE HOW REMOTE WORK WILL IMPACT D.C.'S SALES TAX COLLECTIONS, WE USE DATA ON COMMUTING PATTERNS, COMMUTER SPENDING, AND ASSUMPTIONS FOR WHAT THE FUTURE OF WORK WILL LOOK LIKE.

Inputs on commuter preferences:

Item	Estimate
Total commuters to D.C. that held remote eligible jobs pre-pandemic	155,550
Remote days per week: high estimate	3
Remote days per week: moderate estimate	2
Remote days per week: low estimate	1

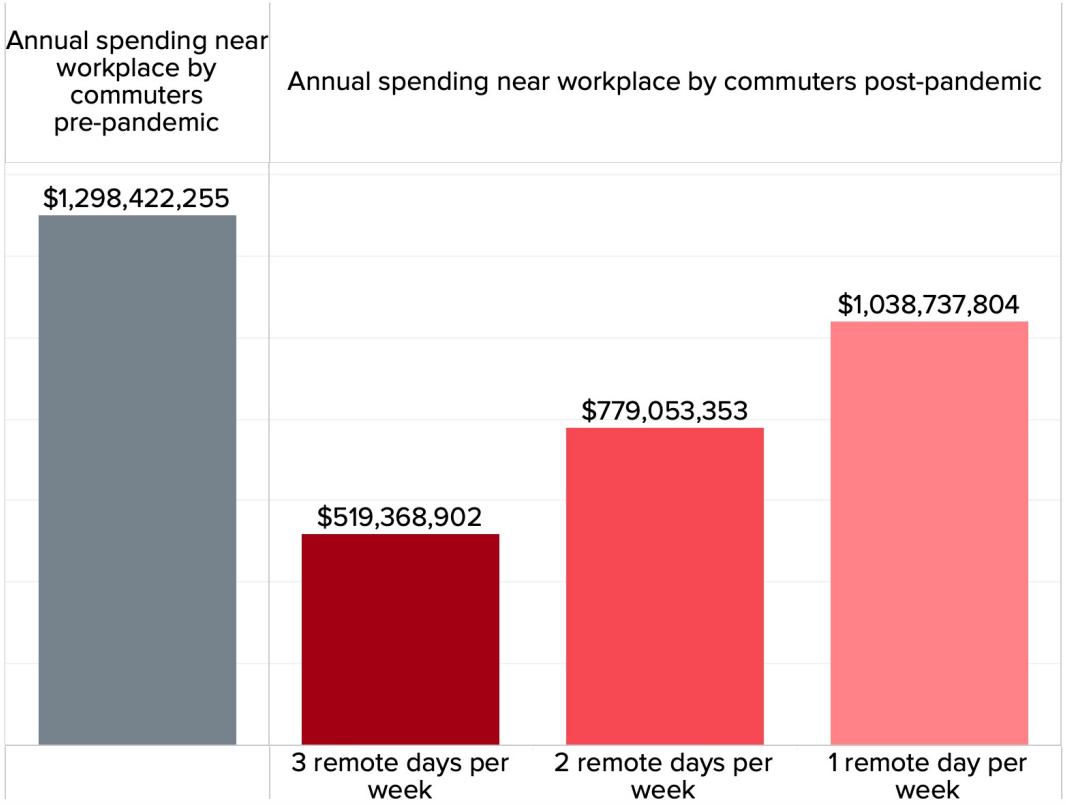
Inputs on commuter spending:

Item	Estimate
Weekly spending per commuter	$166
Number of weeks in the city per year	50
Blended sales tax rate	8%

Source: Weekly spending and blended tax rate estimated using tax base and tax collections data published by the OCFO. Total commuters are estimated using Dingel, Jonathan, and Brent Neiman (2020).+ LEHD Origin-Destination Employment Statistics Data (2019).+ U.S. Census Bureau ACS, 1-year PUMS data (2019).

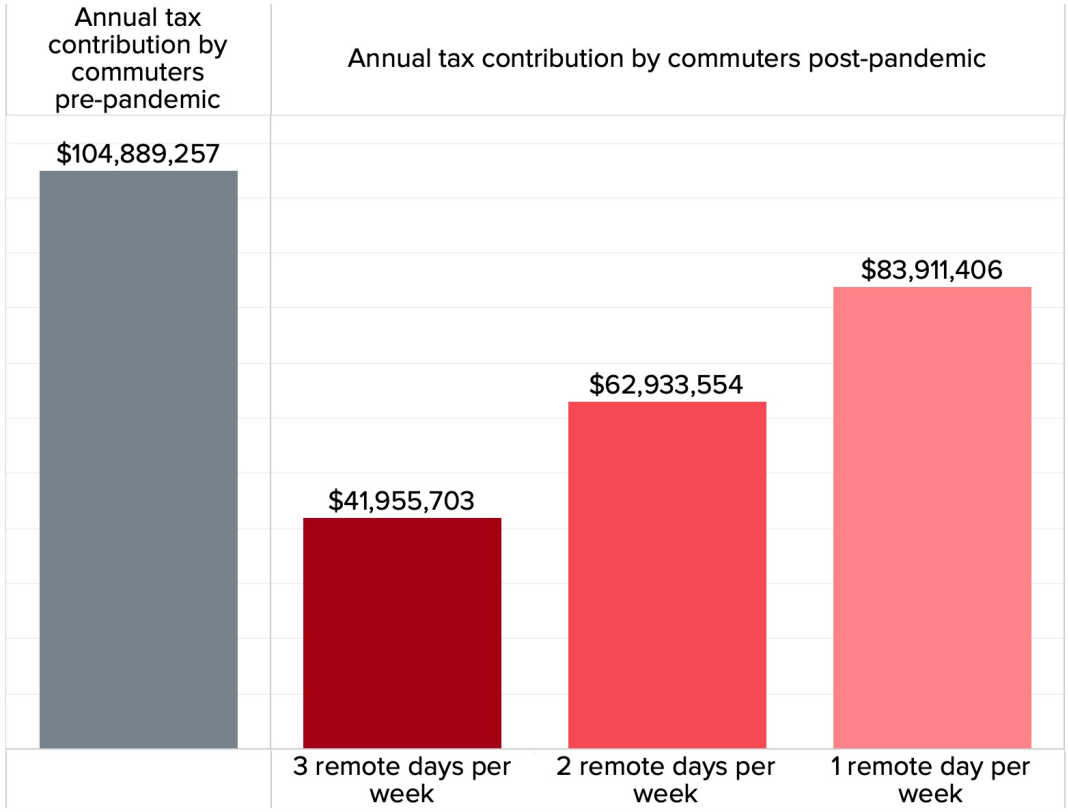
IF 155,500 COMMUTERS TRANSITION TO A HYBRID WORK ARRANGEMENT AFTER THE PANDEMIC, D.C. COULD LOSE UP TO $62.9M IN SALES TAX REVENUE.

Change in annual spending by commuters



Reduction:	-$779,053,353	-$519,368,902	-$259,684,451

Change in annual tax contribution



Reduction:	-$62,933,554	-$41,955,702	-$20,977,851

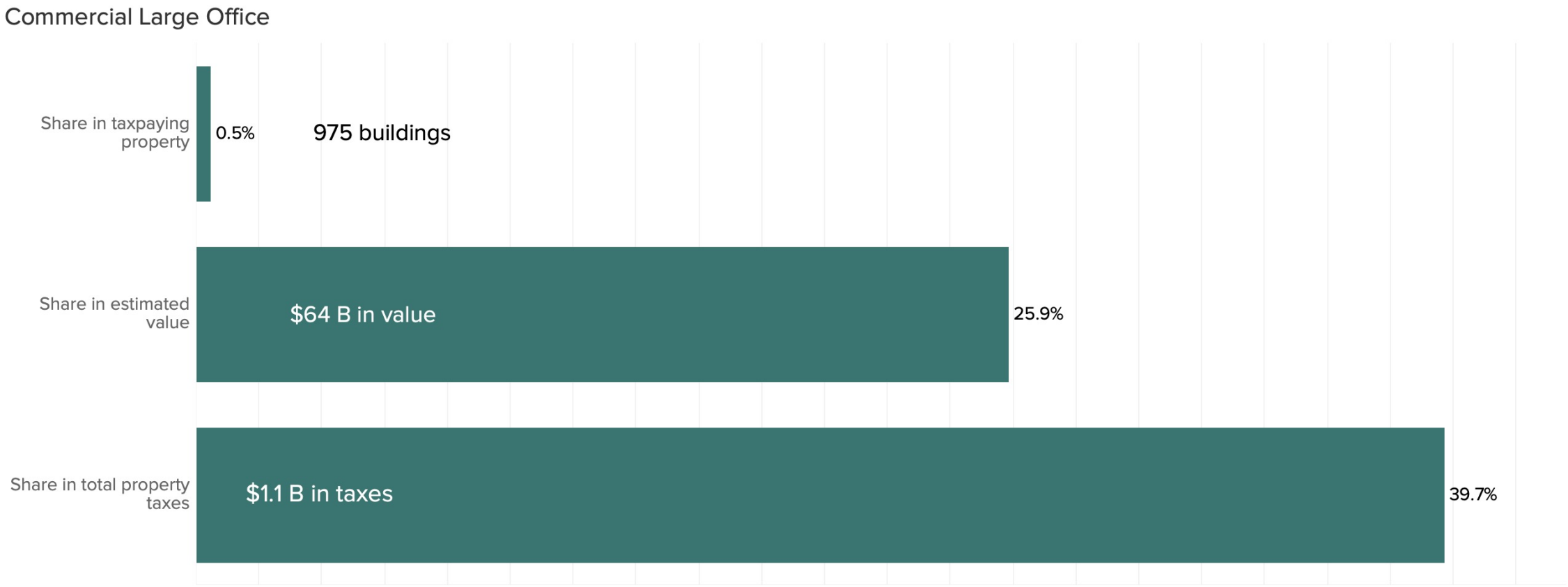
Source: D.C Policy Center calculations. See previous slide for details on sources for inputs. Assumes reduction in spending is equal to reduction in time spent downtown due to remote work and that most eligible workers will switch to a hybrid work arrangement.

04B OFFICE PROPERTY

D.C. POLICY CENTER

The Alice M. Rivlin Initiative

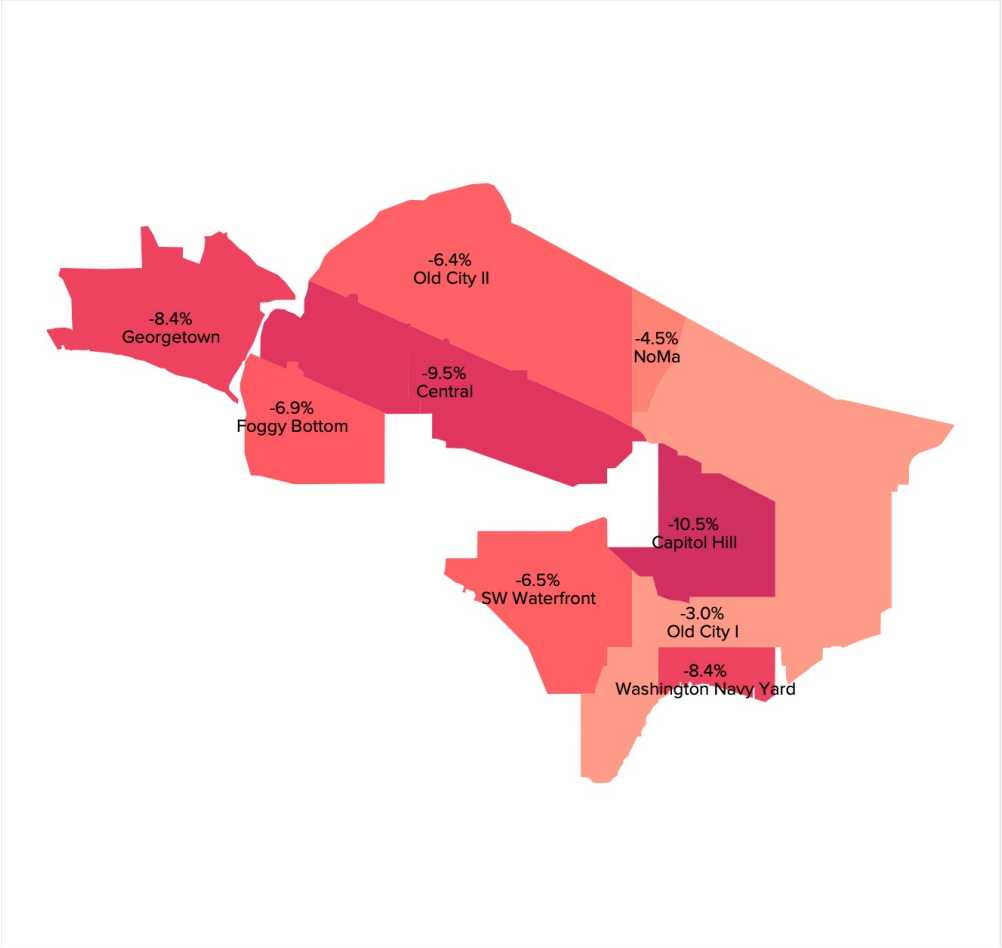
WHY DOES OFFICE PROPERTY MATTER?



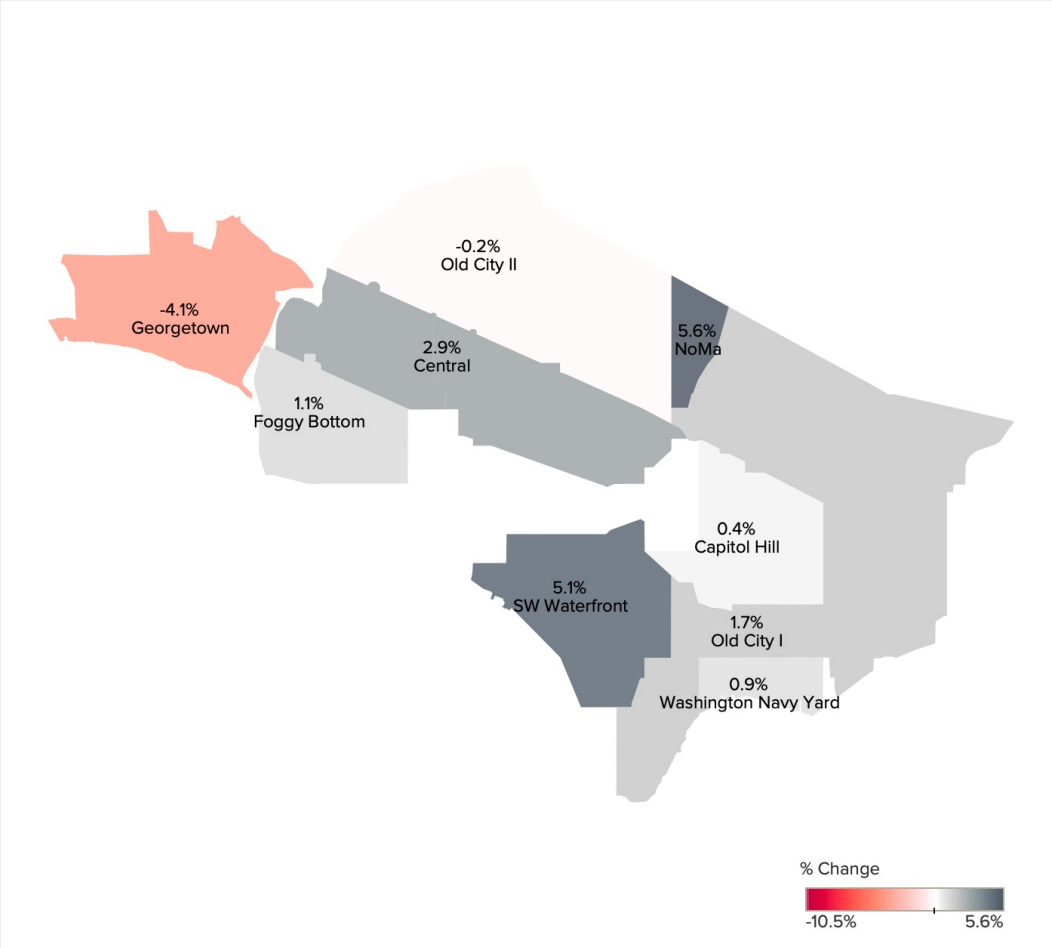
Source: Integrated Tax System Public Extract (Data pulled on April 17, 2022)

DOWNTOWN ACCOUNTS FOR 87 PERCENT OF BUILDINGS, 97 PERCENT OF VALUE AND 98 PERCENT OF TAX REVENUE

Assessment change 2021 to 2022



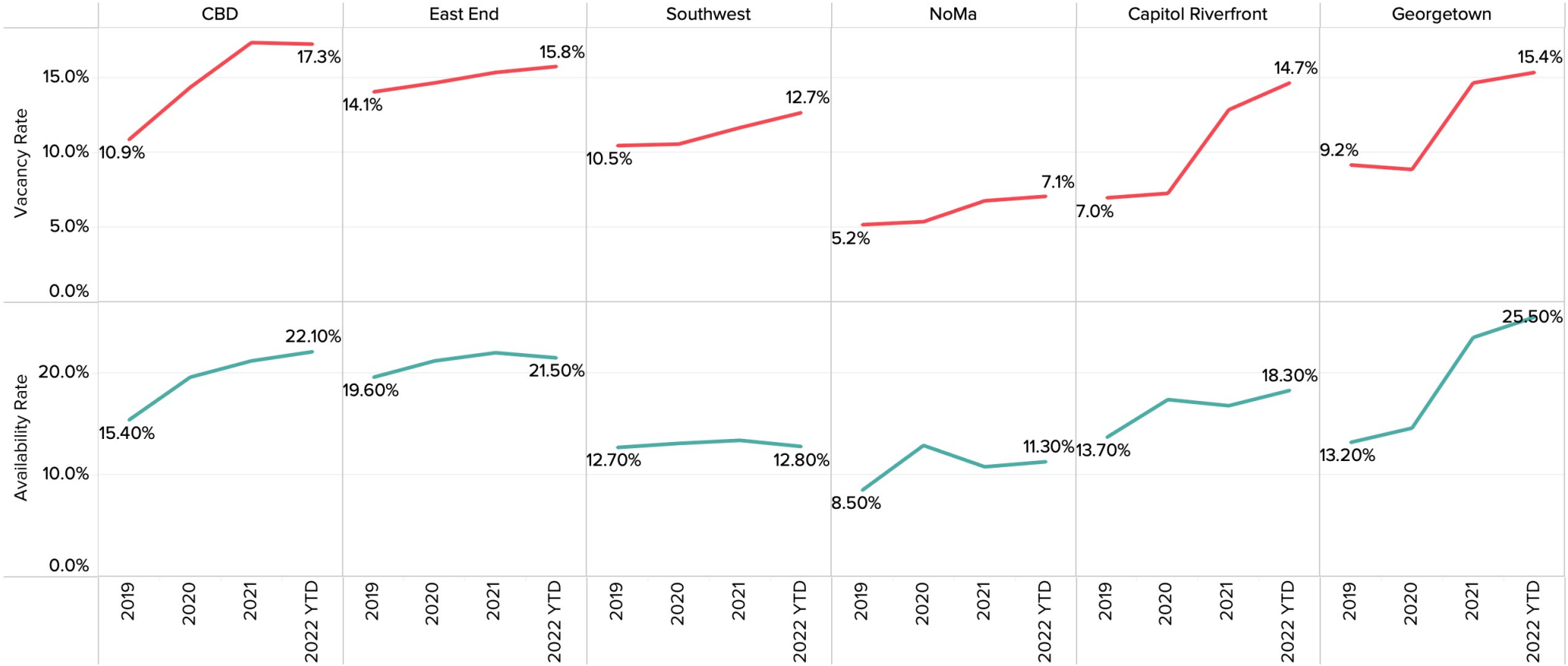
Assessment change 2022 to 2023



Source: OTR

NO REDUCTION IN SIGHT IN VACANCY AND AVAILABLITY

Vacancy and availablity in downtown areas



Source: CoStar

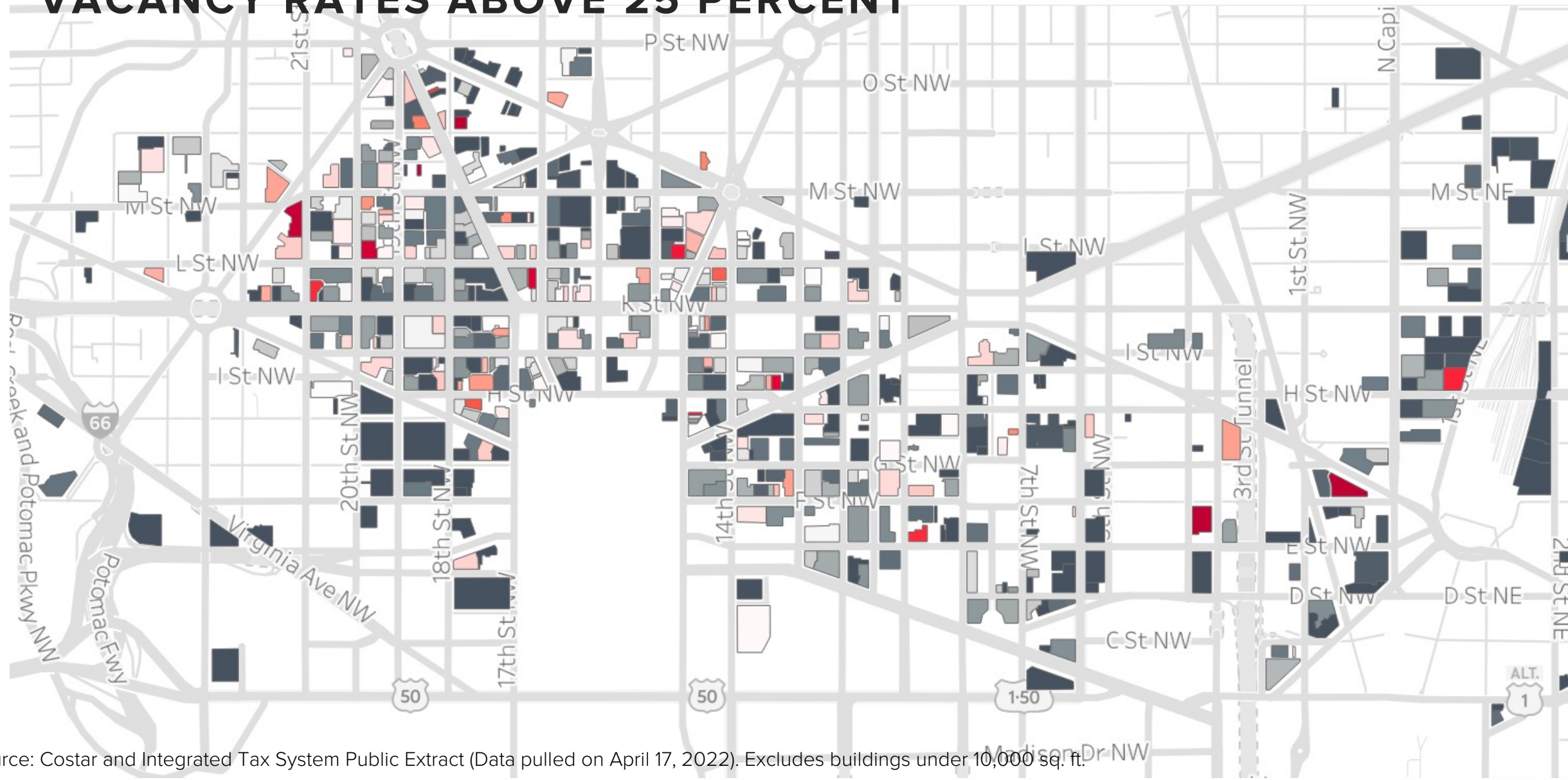
SOME IMPROVEMENT IN COMMERCIAL OFFICE VALUES, PARTLY DRIVEN BY NEW DELIVERIES

Vacant office spaces mean:

1. Lower rent revenue → Lower operating costs → Lower valuations → **Lower real property tax revenue**
2. Fewer workers → Fewer people living in the city → **Lower income tax revenue**
3. Fewer workers → Less economic activity → **Lower sales tax revenue**

OF THE 733 LARGE OFFICE BUILDINGS, 137 HAVE VACANCY RATES ABOVE 25 PERCENT

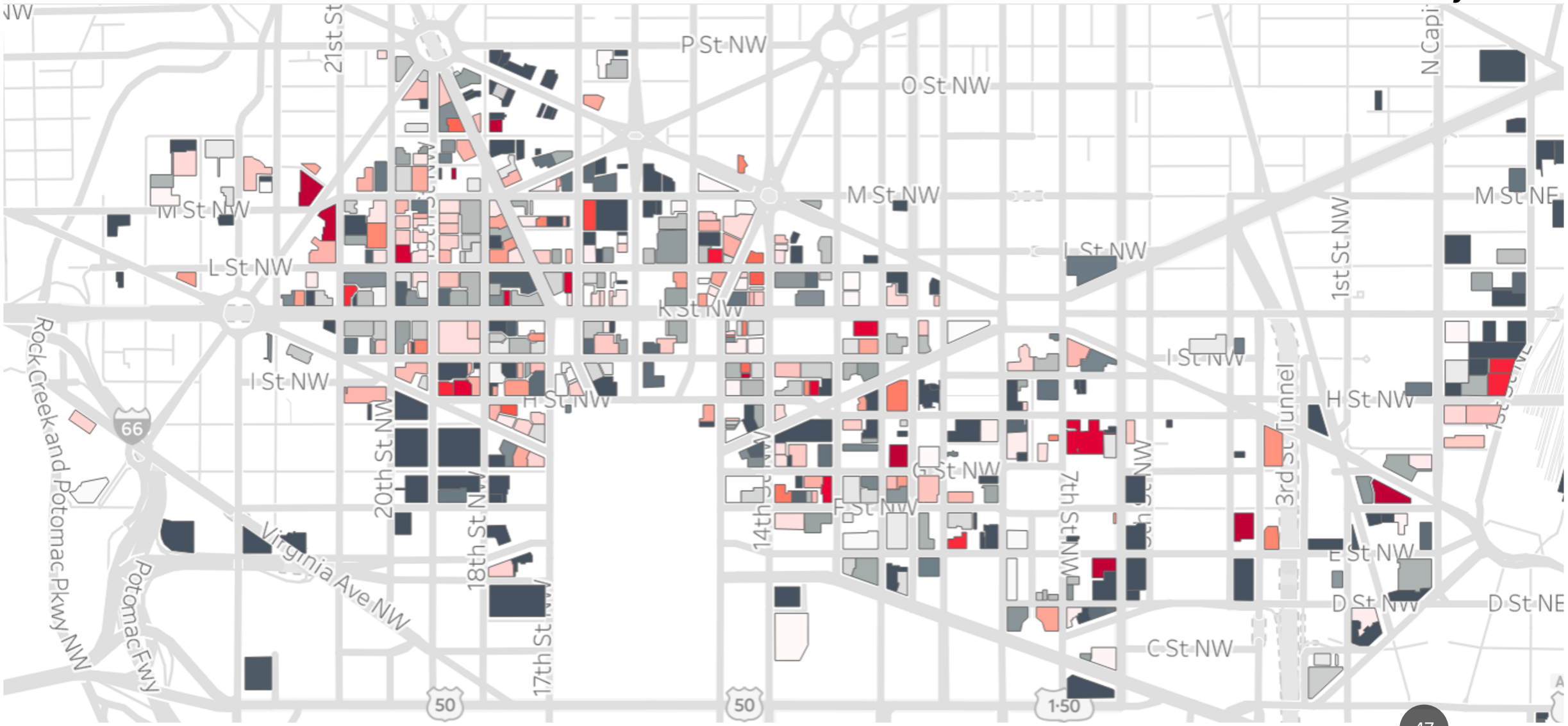
RED: Vacancy > 25%



Source: Costar and Integrated Tax System Public Extract (Data pulled on April 17, 2022). Excludes buildings under 10,000 sq. ft.

THAT NUMBER COULD GO UP TO 238 IF LEASING ACTIVITY DOES NOT IMPROVE

RED:
Potential Vacancy > 25%



Source: Costar and Integrated Tax System Public Extract (Data pulled on April 17, 2022). Excludes buildings under 10,000 sq. ft.

IF LEASING DOES NOT IMPROVE, VACANT SPACE IN 672 LARGE OFFICE BUILDINGS COULD INCREASE TO 31M SF.

Office buildings in central business districts

BID	Number of buildings	TY 2022 Assessment	Proposed TY 2023 Assessment	TY 2022 Obligation	Total inventory	Vacant space	Potential vacant space if leasing doesn't improve
Downtown DC BID	232	25,410,137,332	26,097,289,384	477,370,146	55,353,848	8,379,402	13,805,513
Golden Triangle BID	190	17,858,156,064	18,769,980,900	334,820,937	33,819,642	6,346,535	9,612,506
Southwest BID	28	4,027,552,290	4,271,750,280	76,110,742	10,137,330	779,805	861,125
NoMa BID	32	3,882,545,310	4,147,465,540	68,170,499	9,873,254	578,649	1,274,443
Capitol Riverfront BID	11	1,123,841,170	1,233,371,710	21,194,183	2,948,345	553,461	856,826
Georgetown BID	21	1,362,352,818	1,296,368,690	25,523,969	2,500,151	320,287	719,497
Capitol Hill BID	24	928,610,060	909,958,130	16,925,328	2,260,699	20,298	50,821
Mount Vernon Triangle BID	2	209,735,230	230,226,450	3,963,996	650,285	32,694	87,415
Dupont Circle BID	2	75,921,400	80,838,810	479,251	250,452	46,605	51,827
Outside BID Areas	130	6,022,354,783	6,224,511,674	113,524,338	35,946,171	2,859,836	4,209,116
Grand Total	672	60,901,206,457	63,261,761,568	1,138,083,390	153,740,177	19,917,571	31,529,089

Source: Costar and Integrated Tax System Public Extract (Data pulled on April 17, 2022)

THIS IS ROUGHLY EQUIVALENT OF $6B IN VALUE AND $128M IN TAXES

What might the tax base look like if leasing does not improve?

BID	Number of buildings	Average leased space	Potential increase in vacancy rates	Maximum vacancy	Median Rent	Potential rent loss	Potential Net Operating Income Loss	Proposed TY 2023 Assessment	Potential Value Loss	Potential Tax Loss
Downtown DC BID	232	84%	9%	25%	$52	$295M	$166M	$26,097M	($2,666M)	($60M)
Golden Triangle BID	190	80%	8%	28%	$50	$181M	$114M	$18,770M	($1,984M)	($42M)
NoMa BID	32	94%	8%	14%	$49	$33M	$18M	$4,147M	($311M)	($6M)
Southwest BID	28	88%	2%	12%	$49	$4M	$2M	$4,272M	($37M)	($1M)
Capitol Hill BID	24	98%	8%	9%	$46	$2M	$1M	$910M	($15M)	$0M
Georgetown BID	21	85%	14%	26%	$43	$21M	$14M	$1,296M	($231M)	($4M)
Capitol Riverfront BID	11	82%	9%	27%	$55	$18M	$7M	$1,233M	($143M)	($3M)
Mount Vernon Triangle BID	2	96%	8%	11%	$55	$3M	$1M	$230M	($23M)	$0M
Dupont Circle BID	2	78%	3%	25%	$52	$0M	$0M	$81M	($2M)	$0M
Outside BID Areas	130	89%	7%	17%	$49	$64M	$31M	$6,225M	($496M)	($11M)
Grand Total	672	85%	8%	23%	$50	$621M	$355M	$63,262M	($5,908M)	($128M)

Source: Costar, Integrated Tax System Public Extract (Data pulled on April 17, 2022), and TY 2023 Pertinent Data Handbook for the District of Columbia.

04C INCOME TAX

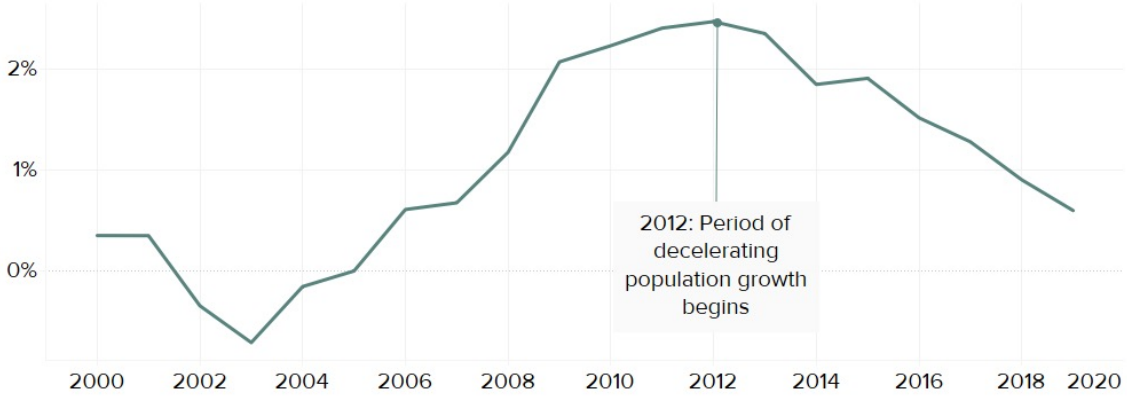
D.C. POLICY CENTER

The Alice M. Rivlin Initiative

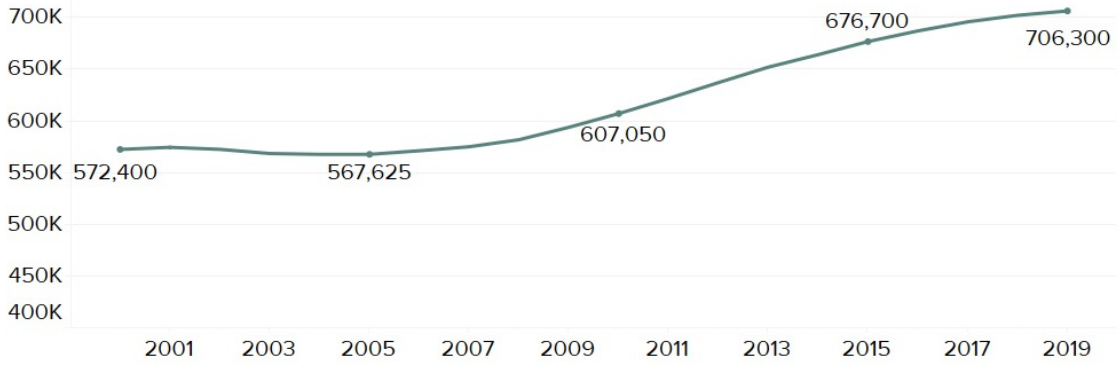
THE PANDEMIC ACCELERATED PRE-PANDEMIC TRENDS, RESULTING IN NET OUT-MIGRATION FROM D.C.

Pre-pandemic population trends: D.C. was experiencing decelerating population growth.

Percent change in population and households from previous year in D.C. (2000 - 2019)

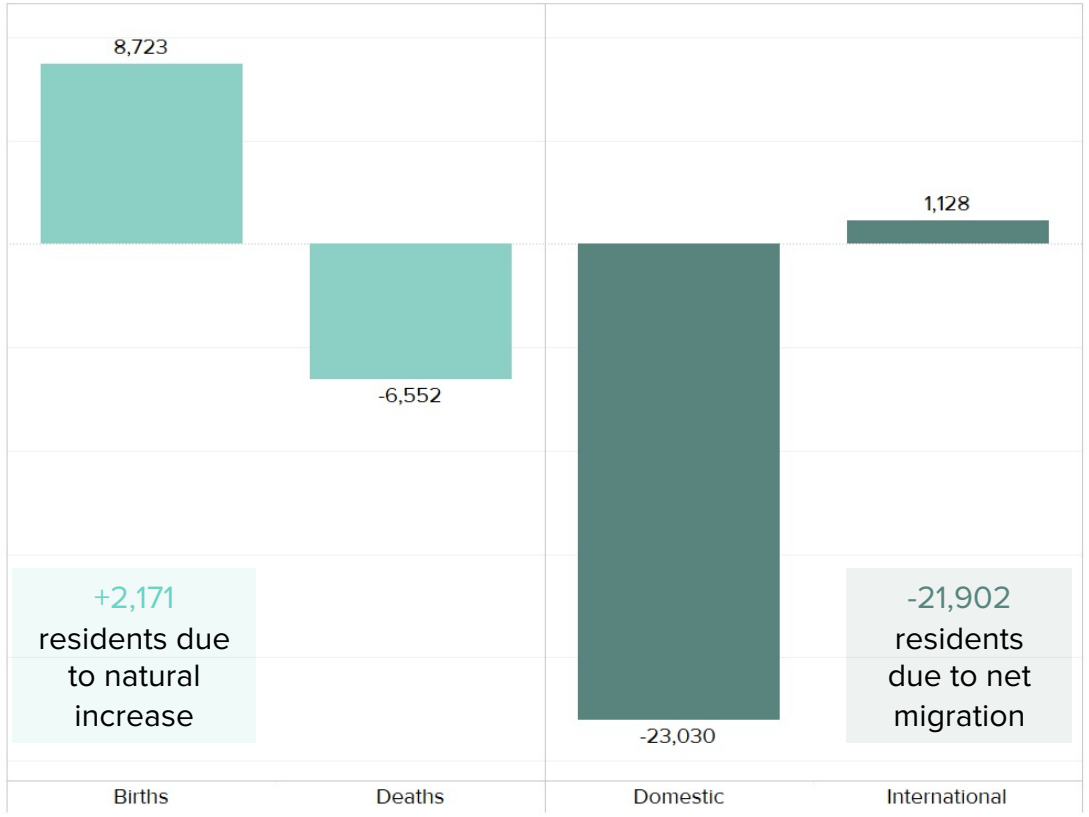


Total population in D.C. (2000 - 2019)



Pandemic population trends: The District lost 20,043 between July 1, 2020 and July 1, 2021, largely due to domestic out-migration.

Components of population change in D.C. (July 1, 2020 - July 1, 2021)

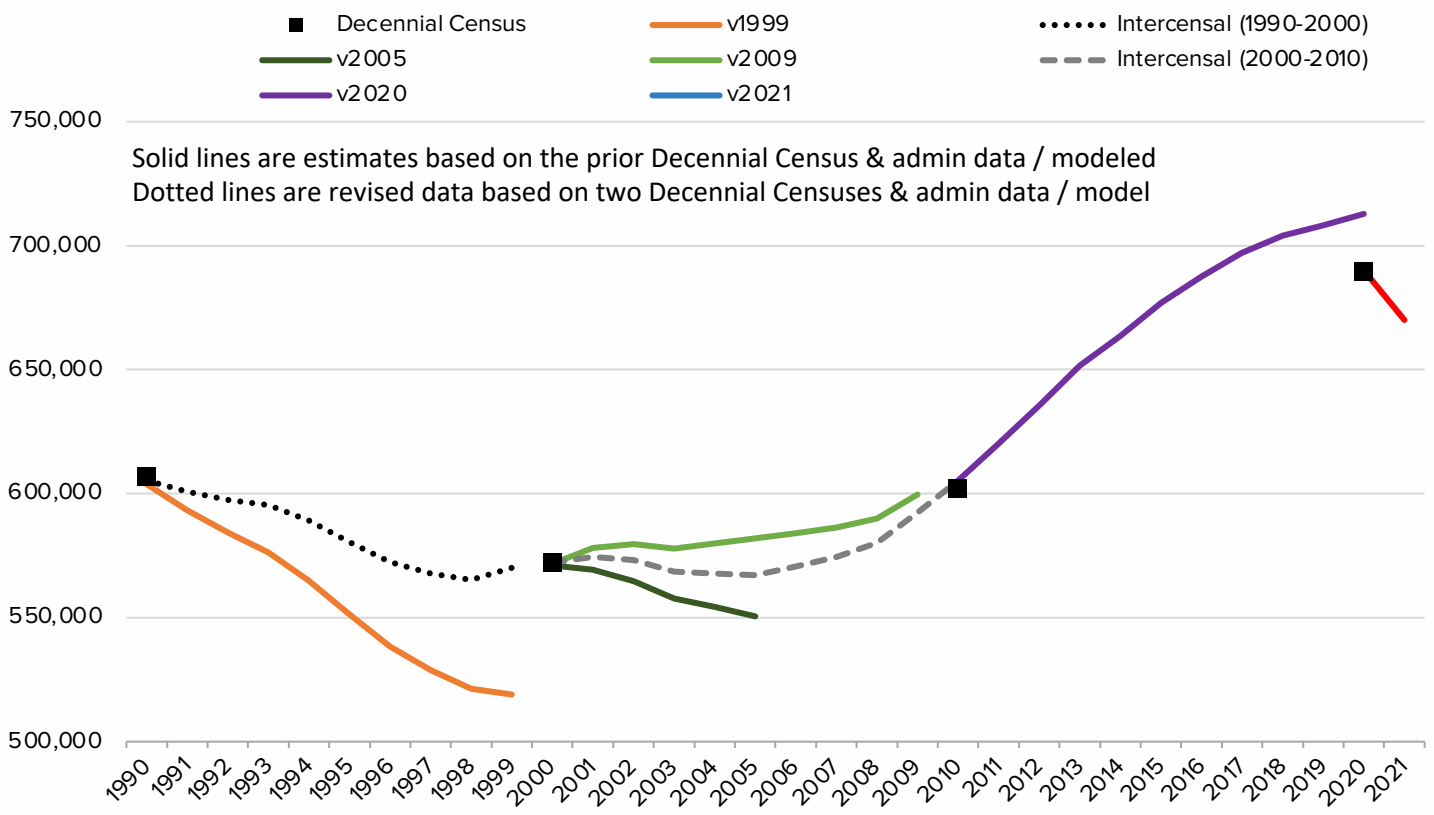


*Graph excludes loss 292 residents that cannot be attributed to a specific component.

Source: D.C. data book (released Feb. 2021); U.S. Census Bureau County Population Estimates and Demographic Components of Population Change: Annual Time Series, April 1, 1990 Census to July 1, 2000 Estimate

BUT, POPULATION ESTIMATES ARE UNRELIABLE, ESPECIALLY IN THE MOST RECENT CENSUS

D.C. population estimates



- The difference between the 2019 estimate and the 2020 decennial count (a decrease) appears to be entirely model error
- The decrease shown between 2020 and 2021 is reflecting an over-correction to the v2019 model that overestimated population growth, at least in part.
- We don't know how many residents D.C. actually lost or how many residents will move as the pandemic continues to change the relationship between where people live and work.

Source: Calculations, graph, and analysis provided by Jeannette Chapman.

ABOUT 53 PERCENT OF FILERS WITH INCOME IN D.C. COULD BE IN REMOTE ELIGIBLE JOBS

Share of filers with income, by size of adjusted gross income, D.C. (2019)

Share

Total filers

- 27 percent of D.C.'s filers come from middle income earners (earning $50K - $100K per year)
- These are likely professionals in remote eligible jobs and those on the lower end of the salary range are likely young professionals that are more likely to move around.
- Another 26% percent of D.C.'s filers come from high income earners (earning greater than $100K per year)

Source: IRS Statistics of Income, Individual Income and Tax Data, by State and Size of Adjusted Gross Income (2019)

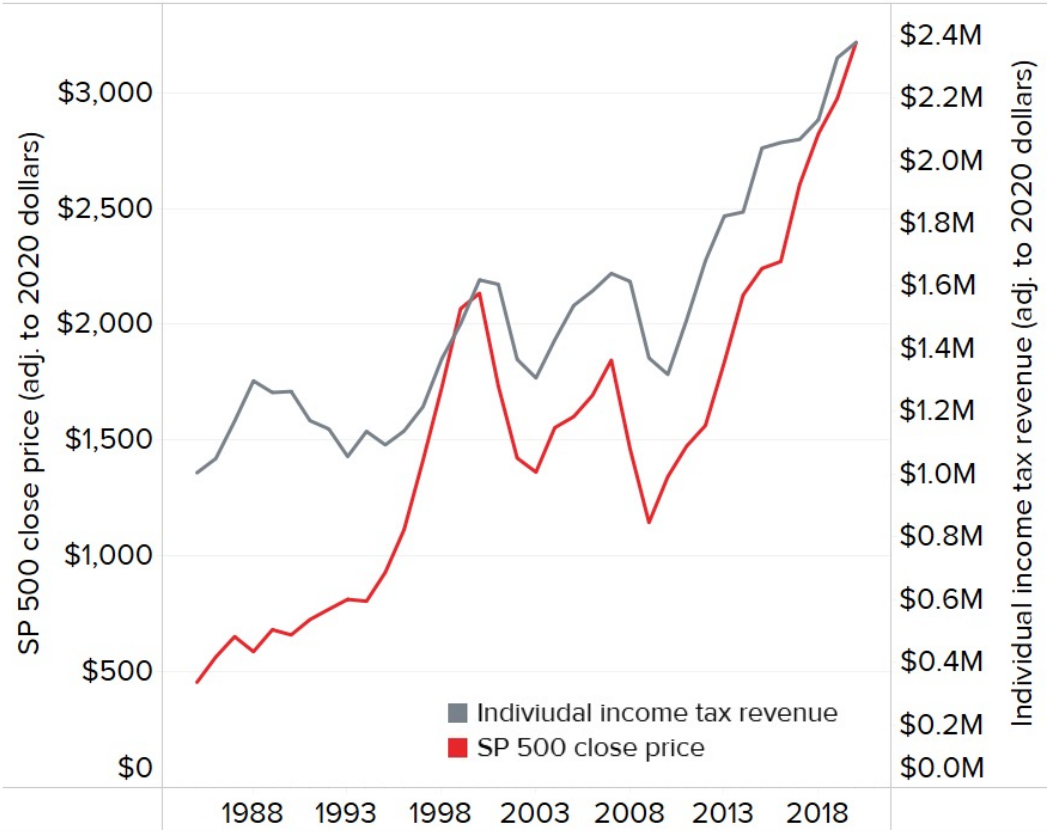
THE WEALTHIER THE TAXPAYER, THE LESS DEPENDENT THEY ARE ON WAGES AND SALARIES.

Salaries and wages as a share of gross income reported by filers, by size of adjusted gross income, D.C. (2019)

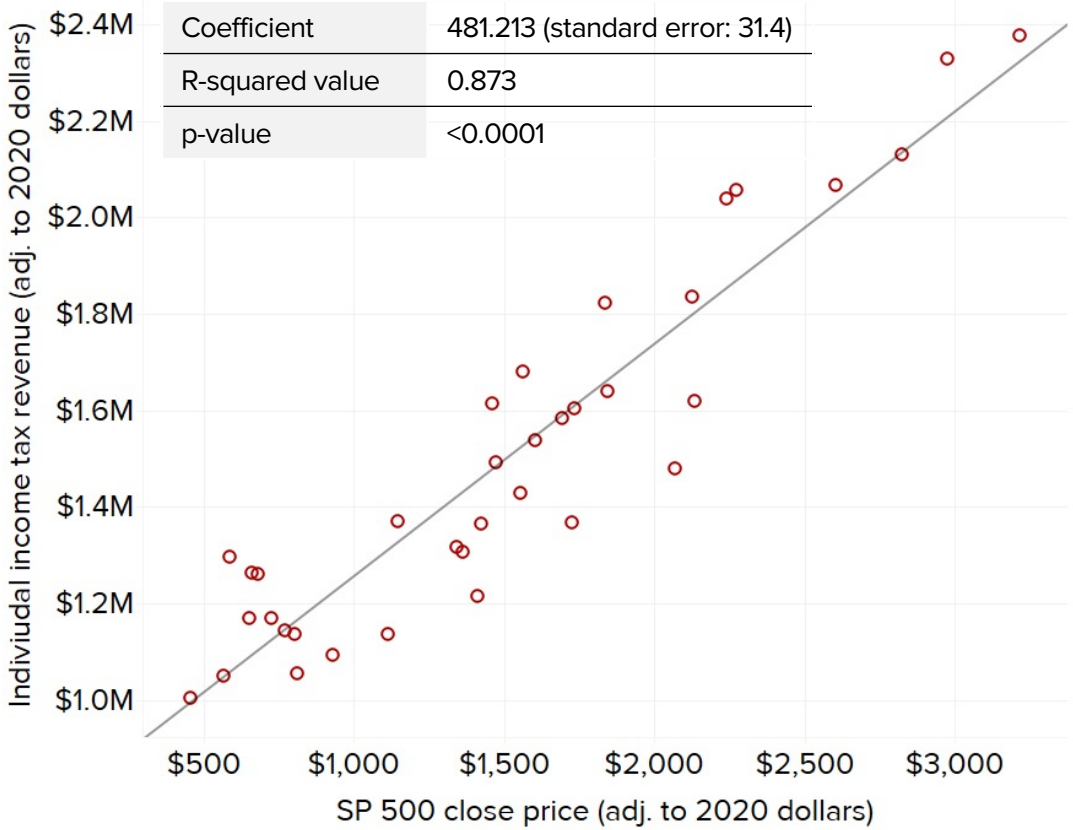
Source: IRS Statistics of Income, Individual Income and Tax Data, by State and Size of Adjusted Gross Income (2019)

INCOME TAX CAN BE VOLATILE, IN PART, BECAUSE IT IS CORRELATED WITH STOCK MARKET PERFORMANCE

Historical SP 500 close price trendline vs. histocial individual income tax revenue trendline



Relationship between individual income tax revenue and SP 500 close price



Source: Yahoo Finance; General Fund Revenue History (OCFO); FRED. Note: The trendline has a coefficient of 481.213, meaning for each $1 increase in the SP 500, there is a $481 increase in D.C.'s income tax revenue. The variation in the SP 500 explains 87% of variation in revenue with a p-value <0.0001.

ESTIMATING HOW REMOTE WORK WILL IMPACT INCOME TAX COLLECTIONS IN THE LONG-TERM IS DIFFICULT BECAUSE THERE IS A LOT WE DON'T KNOW.

WHAT WE KNOW:

- Current population estimates are unreliable, especially as people continue to move around as the pandemic breaks the relationship between where people live and work
- The current models for estimating income tax may have to be revised.
- Income tax revenue can be volatile in economic recessions

WHAT WE DON'T KNOW:

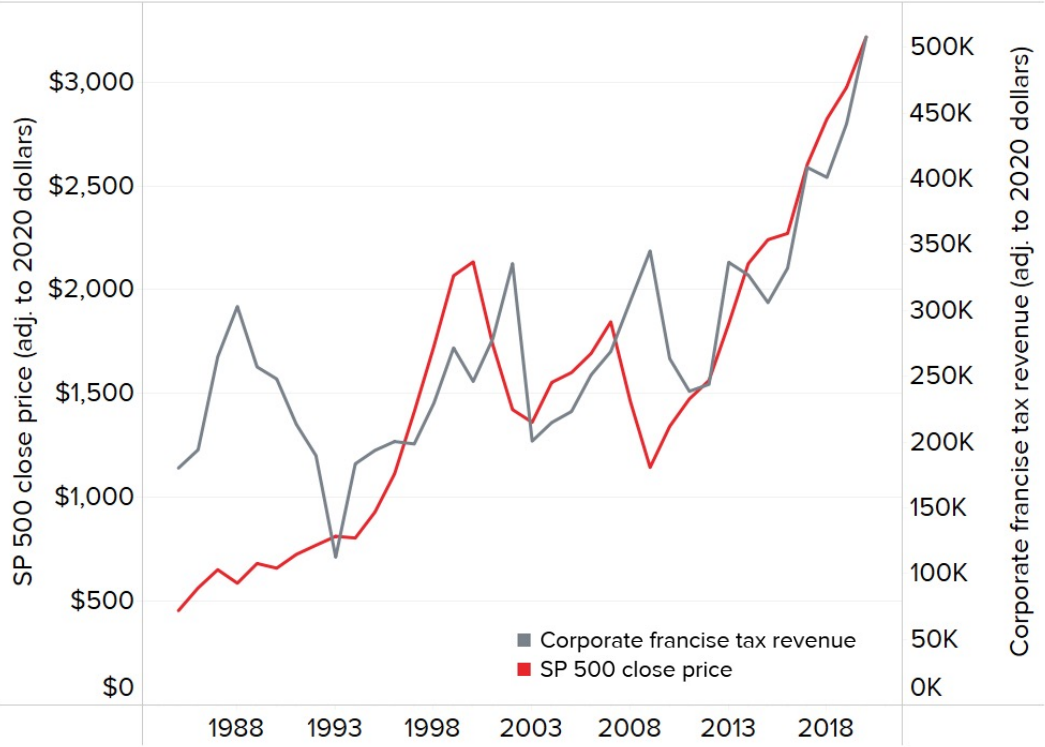
- The rise of remote work makes it easier for residents and workers to move from one jurisdiction to another without having to worry about commute times. We don't yet know to what extent this will alter the region's population.
- If hybrid work arrangements become the norm, people will likely need to live in the region if they hold regional jobs, but the question is where in the region they will choose to live.

WHAT WE CAN DO:

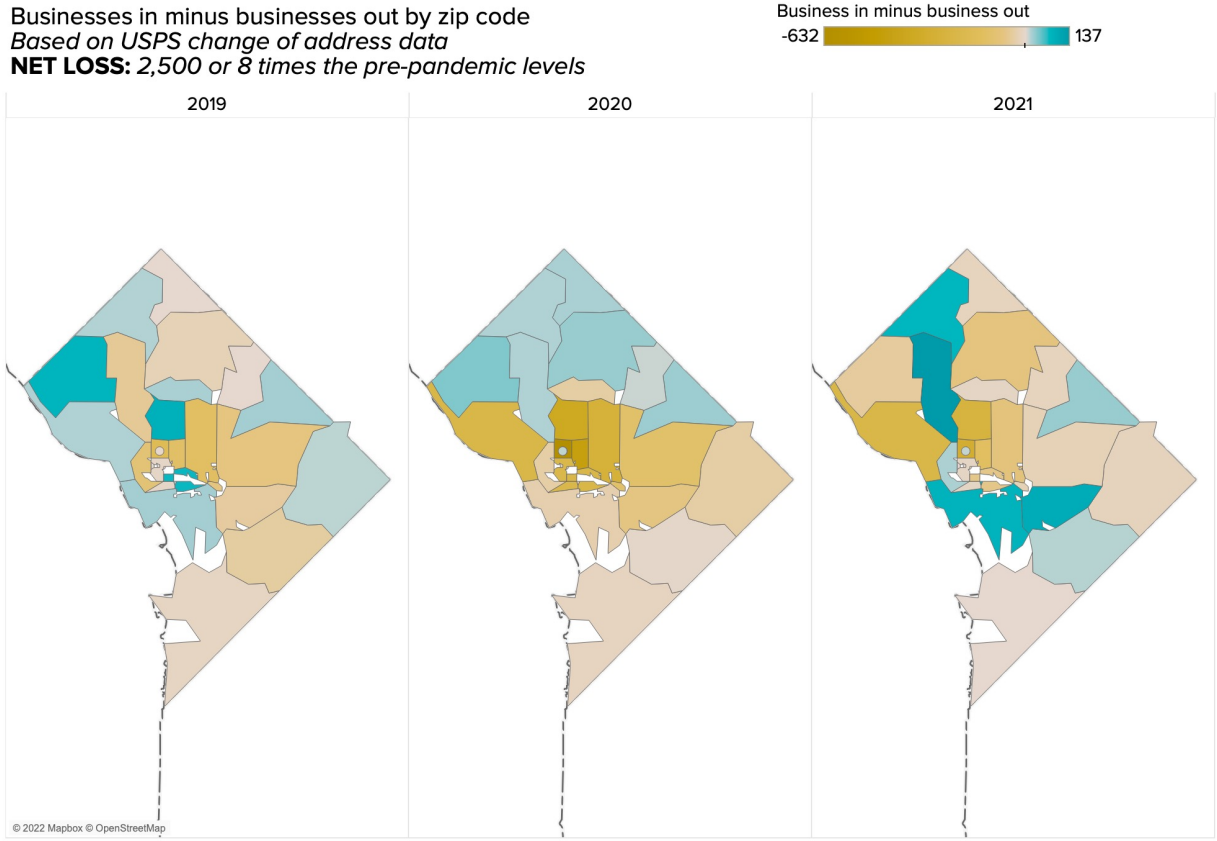
- Update the way income tax is projected
- Work to make sure D.C. is an attractive place to live – retaining existing residents, and attracting new residents

PROJECTIONS ARE EVEN HARDER FOR UB AND CORPORATE FRANCHISE TAXES

Historical SP 500 close price trendline vs. histocial corporate francise tax revenue trendline



Businesses in minus businesses out by zip code
Based on USPS change of address data
NET LOSS: *2,500 or 8 times the pre-pandemic levels*



Source: Yahoo Finance; General Fund Revenue History (OCFO); FRED. Change of address from USPS FOIA Library.

05 APPENDIX

D.C. POLICY CENTER

The Alice M. Rivlin Initiative

DATA NOTES AND METHODOLOGY

The geography of work

Key sources:

- Total commuters are estimated using Dingel, Jonathan, and Brent Neiman (2020), LEHD Origin-Destination Employment Statistics Data (2019), and U.S. Census Bureau ACS, 1-year PUMS data (2019).
- Future work from home trends estimate using various national surveys, primarily: Jose Maria Barrero, Nicholas Bloom, and Steven J. Davis (2022).

Methodology for calculating total commuters:

- Using LEHD Origin-Destination Employment Statistics Data from 2019, we calculated the number of workers that held primary jobs in D.C., but lived in either Maryland or Virginia. We excluded any workers that held a primary job in D.C., but lived further away than Maryland or Virginia, assuming these workers did not commute regularly prior to the pandemic. We then excluded 5% of workers accounting for those that were fully remote prior to the pandemic (Jose Maria Barrero, Nicholas Bloom, and Steven J. Davis (2022)). This initial calculation includes all primary jobs across all industries. The result was 401,481 commuters to D.C. pre-pandemic.
- Next, we applied the share of jobs that can be done from home by industry as estimated by university of Chicago researchers (Dingel, Jonathan, and Brent Neiman (2020)) to PUMS data. The PUMS data included those with a place of work in D.C. and residence in Virginia or Maryland, by industry. PUMS data has more detail on worker industries than LEHD data, but higher errors. Then we applied the share of commuters that can do their jobs from home as estimated by PUMS data to the number of commuters as estimated by LODES data: (198,309/512,009) * 401,481. This estimate excludes education jobs due to lack of data.
- Why did we exclude education jobs? The University of Chicago researchers estimated that 83% of jobs in educational services can be done from home. However, these estimates were created earlier in the pandemic when schools were running virtually. Given that this is likely not the case in the future and that we do not have the survey data to create a new estimate, we removed these jobs from our calculations. For reference, the number of education jobs by county are included on the next slide.

DATA NOTES AND METHODOLOGY

Education services jobs, by county

County Name	Workers	Residents
D.C.	52,112	26,239
Prince George's Co.	43,104	38,070
Montgomery Co.	41,521	45,369
Arlington Co.	8,717	9,443
Fairfax Co.	53,202	48,265
Loudoun Co.	17,223	18,345
Alexandria	5,169	5,924
Total MSA	721,412	714,703
Total Inner Counties	221,048	191,655