DC Vision 2050: Leading Green Economy
Effective Strategy and Plan for Building Owners to Achieve Goals

WASHINGTON, DC
ULI ADVISORY SERVICES

JULY 21-26, 2019
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  - Provides a forum for sharing of **best practices**
  - Writes, edits, and publishes **books** and **magazines**
  - Organizes and conducts **meetings**
  - Directs outreach programs
  - Conducts **Advisory Service Panels**

DowntownDC BID – July 2019
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DowntownDC BID – July 2019
Panel Assignment

How can the DowntownDC BID and building owners cost-effectively meet DC’s sustainability requirements?
Presentation Outline

- Goals & Impediments
- Impacts on NOI and Competitive Market Position
- Building Owners Plan of Action for Efficiency Improvement/reach to NZE
  - Low Hanging Fruit, Audits, Bundling
  - Tenants & Green Leasing
- Stakeholders Roles for Success
  - Near Term Actions for the BID, including how the BID and its Members Achieve Goals Together
  - Near Term Actions for City and DOEE, including City Partnerships with the Federal and Private Sectors
- Policy Areas for Focus
- Conclusion
GOALS & IMPEDIMENTS
Key goals under the DC “CleanEnergyDC Omnibus Amendment Act of 2018”
Otherwise known as “Clean Energy DC”

✓ 50% reduction in GHG emissions by 2032 (100% by 2050)
✓ 100% renewable electricity by 2032
✓ Building Energy Performance Standard (BEPS)
✓ Net Zero energy (NZE) for new construction, starting in 2026
✓ 5% of renewables will come from DC solar projects by 2032 (10% by 2041)
BEPS COMPLIANCE CYCLES

2018
- Clean Energy DC Omnibus Bill Passed

2021
- 1st BEPS Compliance Cycle Begins for 50K+ sf

2023
- 1st BEPS Compliance Cycle Begins for 25-50K sf

2026
- 1st BEPS Compliance Cycle ENDS for 50K+ sf
- 2nd BEPS Compliance Cycle Begins for 50K+ sf
- 1st BEPS Compliance Cycle Begins for 10-25K sf
Green: ENERGY STAR Certifiable (75 and above)
Red: Office average ENERGY STAR score, downtown DC (71.4)

- 895 offices in compliance
- 110 offices out of compliance (2020): Have 5 years to meet reduction targets, or follow complete prescriptive pathway
Green: ENERGY STAR Certifiable (75 and above)
Red: MF average ENERGY STAR score, downtown DC
(57.6)

- 217 buildings in compliance
- 179 buildings out of compliance
More than half of buildings over 50,000 SF will not have to take any action to comply with BEPS 1.

With the right education, technical resources, financing, and time, virtually any building can achieve a 20% improvement in energy efficiency (usually with a payback of under 4 years and IRR above 20%).

The DowntownDC BID is a leader – their office and multifamily properties far outperform the national average, and outperform the DC average.

The DowntownDC BID’s largest tenant (GSA) already requires all the buildings it occupies to have an ENERGY STAR score 75 or higher.

The big question – will there be enough education, resources, funding, and time for everyone to achieve BEPS by 2026?
Buildings Need to Start on Energy Efficiency *Yesterday*

BEPS Compliance Timeline

2019
2020
2021
2022
2023
2024
2025
2026

BEPS timecycle

2021 Measurement years

Establish Median Std

Actual response timeframe

2026 Measurement Years

Energy improvement response process

Efficiency audit, planning & budgeting

Design & Procurement

Permits obtained

Construction & commissioning

DowntownDC BID – July 2019
Recommendations to comply with BEPS 1

- **DOEE and the DowntownDC BID**
  - The BID and DOEE need to start NOW in providing the awareness, technical assistance, financing, and streamlined permitting necessary for building likely to be below the median to hit these goals.
  - DC should develop fines that recognize the challenge of this timeline, and are phased in over 3 years of noncompliance (starting low in 2026 and increasing over time if performance doesn’t continue to improve.)

- **Individual Building Owners**
  - Any buildings who are near the median should get to work ASAP so they can be above average
  - Anyone who falls below the median probably take the prescriptive pathway (at least that way you will actually have close to 5 years to get it done.)
BEPS 2 and 3? Challenging, hard to prepare for, and may be a bar too high for some real estate owners

- BEPS 2 median will be set in 2026, providing only 5 years to hit the new (ambitious) median
- Because owners do not know the 2031 target, they cannot build into their underwriting for major renovation projects, or their capital plan.
- What will happen to buildings that fall below the median two cycles in a row?
- Will DC switch to GHG intensity?

Recommendations:

- Try to project BEPS 2 median, so owners can start planning for 2031 in 2019
- Begin incentivizing NZE retrofits now, with an eye towards this as a compliance pathway through 2050.
- Provide a GHG reduction pathway that includes green power for 2031
Net zero new construction by 2026

- A Net Zero Energy (NZE) Building Code will be enacted by 2026
- Between 2021 and 2026 DOEE will provide a range of support to help the real estate industry prepare:
  - Draft code available now for comment
  - Money for feasibility assessments of NZE buildings
  - Financing options for NZE projects
- Net zero for new construction is possible, but will need significant support to become the market standard by 2026
  - Training for design, MEP, and construction professionals
  - More funding for feasibility studies and pilots ($80K won’t cut it)
  - Significant incentives for NZE buildings developed between 2019 and 2026 (10 year property tax abatement?)
  - Start working with real estate on NZE retrofit now too – will need to be close to NZE by 2036 anyway. Similar incentives needed for existing buildings
DC’s solar RECs are attractive, and community solar programs provide an alternative pathway to support solar in DC for building owners.

Setbacks, height restrictions, and competing roof priorities (green roof, penthouse, mechanical equipment, bocce court) make maximizing solar a challenge.

To meet the goal is daunting – with setbacks, 5% solar would require over 100 million square feet of roof space (that’s 49 Downtown BIDs!)

The only way to get close is to have more solar that looks like AGU – and change zoning and permitting to make it happen.

But…10% solar in DC seems physically impossible. Focus on 100% renewable from PJM!
Additional Challenges to overcome to achieve DC’s 2032 goals

- **Regulatory uncertainty is bad for long-term investment**
  - More certainty on 2032 requirements by 2020 would help owners plan out longer-term investments (especially electrification and mechanical equipment replacement)

- **Another set of requirements on an already “over-required” industry**
  - Engage real estate early and often in developing regulations to comply with law
  - Consider removing regulatory burdens and barriers to ease compliance and improve attitudes

- **The program to help real estate exceed these standards is slow to roll out**
  - Energy audits need to happen this year, and the SEU and Green Bank need to start deploying retrofit capital ASAP if we want to hit 2024-2026 reduction targets.

- **Property Taxes and requirements on “renovation” vs. “new construction” may discourage deep energy retrofits**
  - Keep energy efficiency investments out of tax assessments, and the renovation/new construction threshold.

- **The permitting process needs to speed up, and cost less**
  - Front-of-line permitting for projects to comply with CleanEnergyDC would be a good start

- **The building codes need to adapt to the new DC sustainability priorities, not block them**
  - Need to adapt a range of requirements and restrictions to make net zero buildings and DC solar goals possible
IMPACTS ON NOI & COMPETITIVE POSITION
True building value is established by sales activity

A building block to property value is NOI (Net Operating Income)

A key driver is top line revenue as no amount of operational efficiency can meaningfully increase income without revenue

An immediate reaction for some when the DC Green Energy initiative with BEPS was announced - increased costs and lower values

There is however, ample market evidence that investments in energy efficiency pays off in increased NOI and attracts favorable term financing sources

In the balance of this presentation, we will show how solutions to meet requirements needn’t increase cost, could be cash neutral and may increase value

First, let’s look at some market factors that indicate, in general, that maintaining top line revenue, and hence NOI, isn’t at major risk
Impacts on NOI and Market Valuation

- Total Office Market has grown 4% in SF since 2015
- Vacancy is at 12%, only slightly higher than the 11% at 2015
- Asking rents are at an all time high
- Little market threat to owner NOI

<table>
<thead>
<tr>
<th>Year</th>
<th>Inventory</th>
<th>Inventory SF</th>
<th>Vacant SF Direct</th>
<th>Vacant SF Sublet</th>
<th>Vacant SF Total</th>
<th>Vacant Percent % Direct</th>
<th>Vacant Percent % Sublet</th>
<th>Vacant Percent % Total</th>
<th>Office Gross Rent Overall</th>
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</thead>
<tbody>
<tr>
<td>2019 Q2</td>
<td>320</td>
<td>54,640,095</td>
<td>6,537,320</td>
<td>424,519</td>
<td>6,961,839</td>
<td>12.0</td>
<td>0.8</td>
<td>12.7</td>
<td>$56.20</td>
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<td>2019 Q1</td>
<td>320</td>
<td>54,640,095</td>
<td>6,733,877</td>
<td>405,604</td>
<td>7,139,481</td>
<td>12.3</td>
<td>0.7</td>
<td>13.1</td>
<td>$55.64</td>
</tr>
<tr>
<td>2018 Q4</td>
<td>319</td>
<td>54,538,445</td>
<td>6,362,904</td>
<td>412,122</td>
<td>6,775,026</td>
<td>11.7</td>
<td>0.8</td>
<td>12.4</td>
<td>$54.85</td>
</tr>
<tr>
<td>2018 Q3</td>
<td>318</td>
<td>54,251,595</td>
<td>5,850,790</td>
<td>428,566</td>
<td>6,279,356</td>
<td>10.8</td>
<td>0.8</td>
<td>11.6</td>
<td>$54.89</td>
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<tr>
<td>2018 Q2</td>
<td>318</td>
<td>54,251,595</td>
<td>5,804,974</td>
<td>428,071</td>
<td>6,233,045</td>
<td>10.7</td>
<td>0.8</td>
<td>11.5</td>
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<tr>
<td>2018 Q1</td>
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<td>53,371,725</td>
<td>5,617,293</td>
<td>374,995</td>
<td>5,992,288</td>
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<td>0.7</td>
<td>11.2</td>
<td>$54.94</td>
</tr>
<tr>
<td>1Q &amp; 2Q</td>
<td>320</td>
<td>54,640,095</td>
<td>6,537,320</td>
<td>424,519</td>
<td>6,961,839</td>
<td>12.0</td>
<td>0.8</td>
<td>12.7</td>
<td>$56.20</td>
</tr>
<tr>
<td>2018</td>
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<td>6,362,904</td>
<td>412,122</td>
<td>6,775,026</td>
<td>11.7</td>
<td>0.8</td>
<td>12.4</td>
<td>$54.85</td>
</tr>
<tr>
<td>2017</td>
<td>315</td>
<td>52,957,454</td>
<td>5,696,192</td>
<td>454,761</td>
<td>6,150,953</td>
<td>10.8</td>
<td>0.9</td>
<td>11.6</td>
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<td>2016</td>
<td>314</td>
<td>52,949,555</td>
<td>6,054,633</td>
<td>413,214</td>
<td>6,467,847</td>
<td>11.4</td>
<td>0.8</td>
<td>12.2</td>
<td>$54.98</td>
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<tr>
<td>2015</td>
<td>311</td>
<td>52,438,983</td>
<td>5,757,419</td>
<td>246,546</td>
<td>6,003,965</td>
<td>11.0</td>
<td>0.5</td>
<td>11.4</td>
<td>$54.74</td>
</tr>
</tbody>
</table>
Impacts on NOI and Market Valuation

- DC shows strong over sub-markets
- Higher DC rents due to location and property class
- Sub-markets compete on rents
- Little rent threat to DC NOI
Impacts on NOI and Market Valuation

- Here is the DC office market by class
- Note one can be in DC at adjacent sub-market rent in B space,
- Note the Class A Vacancy evidence of commodity “A” space; occurs as new class A comes to market
- Tenants have options and the lower vacancy in B and C indicate owners are being realistic in rents
- No significant threat to office top line – and consequently NOI

<table>
<thead>
<tr>
<th>Class</th>
<th>Buildings (msf)</th>
<th>Level (msf)</th>
<th>1 yr ch</th>
<th>1 yr %</th>
<th>Vacant space</th>
<th>Level (msf)</th>
<th>Total %</th>
<th>Direct %</th>
<th>Base rent (direct) $</th>
<th>1 yr %</th>
</tr>
</thead>
<tbody>
<tr>
<td>Class A</td>
<td>317</td>
<td>87.29</td>
<td>2.48</td>
<td>2.9</td>
<td></td>
<td>76.07</td>
<td>1.23</td>
<td>1.6</td>
<td>$56.77</td>
<td>4.6</td>
</tr>
<tr>
<td>Class B</td>
<td>945</td>
<td>57.81</td>
<td>-1.06</td>
<td>-1.8</td>
<td></td>
<td>52.33</td>
<td>-0.93</td>
<td>-1.7</td>
<td>$49.61</td>
<td>6.0</td>
</tr>
<tr>
<td>Class C</td>
<td>1,102</td>
<td>10.20</td>
<td>-0.06</td>
<td>-0.5</td>
<td></td>
<td>9.74</td>
<td>-0.04</td>
<td>-0.4</td>
<td>$35.20</td>
<td>-5.4</td>
</tr>
</tbody>
</table>

Source: CoStar. Data as of April 17, 2019
Impacts on NOI and Market Valuation

- Job Growth in a demand driver - office and housing
- Note the increase in period Private Sector employment
- Private sector wages and salaries showed very strong growth
- Employment as a demand driver supports stable rents and NOI

<table>
<thead>
<tr>
<th>Jobs in DC and wages and salaries earned in them since 2011.3</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Jobs</strong></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td><strong>Sector</strong></td>
</tr>
<tr>
<td>Federal sector</td>
</tr>
<tr>
<td>Private sector</td>
</tr>
<tr>
<td>State and local</td>
</tr>
<tr>
<td>Total</td>
</tr>
</tbody>
</table>

Source: BLS (for wage and salary employment) and BEA (for wages and salaries). All data are 12-month moving averages for the periods shown. Total wages includes military.
Impacts on NOI and Market Valuation

- Of the private sector employment growth, note the strength in Tech
- Tech is characterized by high wages
- DC percentage of regional Tech jobs is significant
- Growth in tech jobs is an office demand driver
- Strong office demand is a rent and NOI stabilizer

**Table 7. Wage and salary employment located in DC: March 2019**

<table>
<thead>
<tr>
<th>Industry sector</th>
<th>3-month moving average</th>
<th>1 year change</th>
<th>Sector % of all DC jobs in Mar. 2019</th>
<th>DC share (%) in Mar. 2019 of all sector jobs</th>
</tr>
</thead>
<tbody>
<tr>
<td>Federal government</td>
<td>196,733</td>
<td>194,500</td>
<td>-2,233</td>
<td>-1.1</td>
</tr>
<tr>
<td>Local government</td>
<td>41,000</td>
<td>42,033</td>
<td>1,033</td>
<td>2.5</td>
</tr>
<tr>
<td>Legal services</td>
<td>28,133</td>
<td>28,600</td>
<td>467</td>
<td>1.7</td>
</tr>
<tr>
<td>Professional and tech. (except legal)</td>
<td>89,500</td>
<td>91,267</td>
<td>1,767</td>
<td>2.0</td>
</tr>
<tr>
<td>Employment services</td>
<td>13,333</td>
<td>13,533</td>
<td>200</td>
<td>1.5</td>
</tr>
</tbody>
</table>
Housing has been a growth driver in the DC economy in recent years.

- Fully absorbed 21,000 multifamily units in 5 years.
- Vacancy is trending down.
- Effective Rents are slightly ahead of inflation.
- No rent threat to NOI.

### Table 15. Apartment units in DC: 2013 to 2019.1

<table>
<thead>
<tr>
<th></th>
<th>Level</th>
<th>Average rent</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Inventory</td>
<td>Occupied</td>
</tr>
<tr>
<td>2013</td>
<td>124,947</td>
<td>115,251</td>
</tr>
<tr>
<td>2014</td>
<td>129,541</td>
<td>119,438</td>
</tr>
<tr>
<td>2015</td>
<td>132,031</td>
<td>123,719</td>
</tr>
<tr>
<td>2016</td>
<td>135,939</td>
<td>126,314</td>
</tr>
<tr>
<td>2017</td>
<td>141,298</td>
<td>131,058</td>
</tr>
<tr>
<td>2018</td>
<td>145,057</td>
<td>135,765</td>
</tr>
<tr>
<td>2019.1</td>
<td>146,159</td>
<td>136,377</td>
</tr>
<tr>
<td>1 Q ch</td>
<td>906</td>
<td>642</td>
</tr>
</tbody>
</table>

Source: CoStar, as of April 17, 2019.
Impacts on NOI and Market Valuation

- Real Property taxes were 33% of DC in 2018
- Stable percentage to 2021

<table>
<thead>
<tr>
<th>Tax</th>
<th>2018</th>
<th>2019</th>
<th>2020</th>
<th>2021</th>
<th>2022</th>
</tr>
</thead>
<tbody>
<tr>
<td>Real property</td>
<td>2,554.2</td>
<td>2,696.8</td>
<td>2,768.9</td>
<td>2,857.5</td>
<td></td>
</tr>
<tr>
<td>Deed taxes</td>
<td>472.3</td>
<td>482.7</td>
<td>496.2</td>
<td>516.4</td>
<td></td>
</tr>
<tr>
<td>General sales</td>
<td>1,492.6</td>
<td>1,551.1</td>
<td>1,664.5</td>
<td>1,735.2</td>
<td></td>
</tr>
<tr>
<td>Individual income</td>
<td>2,066.8</td>
<td>2,136.5</td>
<td>2,232.4</td>
<td>2,319.7</td>
<td></td>
</tr>
<tr>
<td>Withholding</td>
<td>1,818.2</td>
<td>1,873.6</td>
<td>1,965.3</td>
<td>2,048.5</td>
<td></td>
</tr>
<tr>
<td>non-withholding</td>
<td>248.7</td>
<td>263.0</td>
<td>267.1</td>
<td>271.1</td>
<td></td>
</tr>
<tr>
<td>Business income</td>
<td>574.7</td>
<td>540.4</td>
<td>554.0</td>
<td>564.1</td>
<td></td>
</tr>
<tr>
<td>Other</td>
<td>610.7</td>
<td>605.9</td>
<td>597.4</td>
<td>602.4</td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>7,771.3</td>
<td>8,013.5</td>
<td>8,313.4</td>
<td>8,595.3</td>
<td></td>
</tr>
</tbody>
</table>

Source: ORA, Feb. 28, 2019 revenue estimate. Deed taxes include economic interest. The table includes earmarked revenues. FY 2018 is from the CAFR.
Impacts on NOI and Market Valuation

- Used two property types to illustrate market stability
- In general, no significant visible threat to owner NOI from rents
- Solid DC job growth
- Job growth has high wage level
- DC tax revenue projections on Real Property to be a stable percentage near term
- Factors for maintaining real estate values are strong
- Solid real estate market foundation to embark on a DC wide Clean Energy Plan, including BEPS
BUILDING OWNERS
PLAN OF ACTION
FOR EFFICIENCY
LOW HANGING FRUIT
BUNDLING TO ACHIEVE NET ZERO
Building Owners Plan of Action
Meeting the Goals Cost Effectively

- **Perform an Energy Audit**
  - Where are there good efficiencies
  - Where are there opportunities for energy reductions

- **Target Non-Invasive - Highly Profitable Improvements**
  - HVAC Tune-Up, LED Lighting, Window film & Caulking
  - Enhanced Management - Manage start-up and shut-down, temperature setpoints, and operating hours.
  - Enhance tenant engagement – shut it off, use stairs and revolving door, don’t use space heaters, and let the building know when no one will be in the office

- **Result**
  - These methods should reduce energy consumption by 20%, and can be a prescriptive path to meeting the requirements.
  - **ROI** - Typically a 2-3 year payback
How do you design/develop to NZE?
Building Owners’ Plan of Action
The Cost-Effective Approach to ZNE

- Set your Design Team
  - Mechanical Engineer, Electrical Engineer
  - General Contractor, Architect
  - Solar Contractor, Mechanical Subcontractor
  - Mechanical Subcontractor
  - Owner / Developer

- Take a Holistic Approach
  - Weave multiple methodologies and materials together
  - Avoid looking at products in a silo relative to ROI
  - The sum is more cost-effective than the parts
  - The typical ROI for a ZNE retrofit is approximately 5 yrs.
Building Owners’ Plan of Action
HVAC at SHARP Development as an Example

- **HVAC Tune-Up**: 30% Reduction
  - Controls, Sensors, VFD’s, VAV
- **High Performance Envelope**: 50% Reduction
  - Wall and Ceiling Insulation, low-e and dynamic glass
- **Ceiling Fans**
  - Provide air movement to lower perceived temperature
- **Operable Windows**
  - Allow for night flushing and air exchange
- **Expose Thermal Mass**
  - Very efficient heat sink that will absorb human and computer heat
- **Building Management Software**
  - Coordinates all of the above
- **Results**: 75% Reduction
  - Lower first cost, reduced maintenance cost, eliminates
TENANTS & GREEN LEASING
### Snapshot of the DC Office & Apartment Markets

- DC is the fifth largest metropolitan area in the US by Gross Metropolitan Product (GMP) and the sixth largest by population.
- As the nation’s capital region, DC is heavily dependent on government activity, with the government sector accounting for 22% of total employment and 23% of total GMP. However, the region’s economy is becoming increasingly diversified.
- According to the 2019 CBRE Tech Talent report, the DC office market is one of the top five (5) most expensive in the US, ranking third behind San Francisco and New York.
- The cost of DC’s multi-family apartments rank in the top ten (10) most expensive at #8.

<table>
<thead>
<tr>
<th>Q1 2019 Office</th>
<th>Q1 2019 Apartments</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Market</strong></td>
<td><strong>Annual Gross Direct Asking Rent Per SF</strong></td>
</tr>
<tr>
<td>New York, NY</td>
<td>$78.87</td>
</tr>
<tr>
<td>SF Bay Area, CA</td>
<td>$68.88</td>
</tr>
<tr>
<td>Washington, D.C.</td>
<td>$42.22</td>
</tr>
<tr>
<td>Los Angeles, CA</td>
<td>$41.28</td>
</tr>
<tr>
<td>Miami, FL</td>
<td>$39.76</td>
</tr>
<tr>
<td>Boston, MA</td>
<td>$39.36</td>
</tr>
<tr>
<td>Austin, TX</td>
<td>$37.62</td>
</tr>
<tr>
<td>Seattle, WA</td>
<td>$37.53</td>
</tr>
<tr>
<td>San Diego, CA</td>
<td>$36.09</td>
</tr>
<tr>
<td>Orange County, CA</td>
<td>$35.52</td>
</tr>
</tbody>
</table>
Market Driver: Tech Talent
Washington, DC Ranks # 4

- Technology companies are directly and indirectly the largest driver of demand for office product in cities
- Tens of thousands of tech jobs have been created over the past five years
- The in-migration of the tech workers into cities is having a positive effect on housing product, too
- Technological innovation is causing structural shifts, extending the economic cycle and possibly cushioning tech markets from future downturns
#4 WASHINGTON, DC

## Employment Breakdown

<table>
<thead>
<tr>
<th>Occupation</th>
<th>Employed 2018</th>
<th>Growth 2013-18</th>
<th>Average Wage 2013-18</th>
</tr>
</thead>
<tbody>
<tr>
<td>TOTAL TECH OCCUPATIONS</td>
<td>253,660</td>
<td>2.2%</td>
<td>$112,735</td>
</tr>
<tr>
<td>Software Developers &amp; Programmers</td>
<td>75,850</td>
<td>-8.0%</td>
<td>$116,004</td>
</tr>
<tr>
<td>Computer Support, Database &amp; Systems</td>
<td>142,550</td>
<td>10.5%</td>
<td>$103,446</td>
</tr>
<tr>
<td>Computer &amp; Information Systems Managers</td>
<td>18,220</td>
<td>0.9%</td>
<td>$173,470</td>
</tr>
<tr>
<td>Technology Engineering-Related</td>
<td>17,040</td>
<td>-8.8%</td>
<td>$110,948</td>
</tr>
<tr>
<td>TOTAL NON-TECH OCCUPATIONS</td>
<td>399,220</td>
<td>7.8%</td>
<td>$84,338</td>
</tr>
<tr>
<td>Sales</td>
<td>41,920</td>
<td>35.4%</td>
<td>$86,118</td>
</tr>
<tr>
<td>Administrative &amp; Office Support</td>
<td>213,990</td>
<td>3.0%</td>
<td>$42,719</td>
</tr>
<tr>
<td>Business Operations &amp; Finance</td>
<td>93,320</td>
<td>3.0%</td>
<td>$90,841</td>
</tr>
<tr>
<td>Marketing</td>
<td>49,990</td>
<td>22.4%</td>
<td>$89,139</td>
</tr>
</tbody>
</table>


## Office Rent & Vacancy Trends

- Office Rent (US$)
- Vacancy (%)

## Population Trends

The population of twentysomethings grew by 2,913 (2.2%) since 2012. That’s 4.7% of total growth in a population of 693,972.

## Labor Force Pipeline and Education

### Tech Degree Completions

<table>
<thead>
<tr>
<th>Category</th>
<th>Growth 2012-17</th>
</tr>
</thead>
<tbody>
<tr>
<td>TOTAL TECH DEGREES</td>
<td>11,278</td>
</tr>
<tr>
<td>Computer Engineering</td>
<td>9,061</td>
</tr>
<tr>
<td>Math/Statistics</td>
<td>765</td>
</tr>
<tr>
<td>Other Tech Engineering</td>
<td>1,452</td>
</tr>
</tbody>
</table>

### Educational Attainment (2018)

- Bachelor’s Degree or Higher: 57.3%

Source: The National Center for Education Statistics (Regional), 2019.
HOUSING & RELATIVE COSTS* (US = 100%)

AVERAGE APARTMENT RENT: $1,754 PER UNIT/MO.
8% FIVE-YEAR GROWTH

117% LIVING COST
116% BUSINESS COST

Source: Apt. rent data from CBRE EA (Metro), Q1 2019.

Source: Relative Costs from Moody’s Analytics (Metro Area), Q1 2019.

TECH TALENT DIVERSITY

69% MALE
31% FEMALE

Source: U.S. Census Bureau (Metro Area), 2017.

TOP TECH OFFICE SPACE DEALS (2019)

<table>
<thead>
<tr>
<th>Tenant</th>
<th>Address</th>
<th>Sq. Ft.</th>
</tr>
</thead>
<tbody>
<tr>
<td>CACI</td>
<td>1099 14th St NW</td>
<td>77,300</td>
</tr>
<tr>
<td>Facebook</td>
<td>575 7th St NW</td>
<td>73,800</td>
</tr>
<tr>
<td>EverFi</td>
<td>2300 N St NW</td>
<td>58,000</td>
</tr>
<tr>
<td>Diligent</td>
<td>1111 19th St NW</td>
<td>34,900</td>
</tr>
<tr>
<td>Apple</td>
<td>700 K St NW</td>
<td>29,000</td>
</tr>
</tbody>
</table>

Source: CBRE Research (Office Market), 2019.

START-UP PIPELINE

<table>
<thead>
<tr>
<th>Top Regional Universities</th>
<th>Company Count</th>
<th>Capital Raised ($ Billions)</th>
</tr>
</thead>
<tbody>
<tr>
<td>University of Maryland</td>
<td>301</td>
<td>3.8</td>
</tr>
<tr>
<td>University of Virginia</td>
<td>316</td>
<td>4.9</td>
</tr>
<tr>
<td>Georgetown University</td>
<td>253</td>
<td>4.3</td>
</tr>
</tbody>
</table>

VC-Funded Companies Founded by Alumni of Top Regional Universities:

N/A

Renewable Trends Continue in the Private Sector

- Owners, occupiers, det & equity investors already see value in renewables
- Virtual war to attract and retain the best talent in the country.
- Companies defined by the quality of design and construction of their office environments.
- Offices showcase culture and reflect how employers value their employees.
- Establish governance policies (ESG) dealing with health and well being, energy efficiencies, sustainability and resilience
- ESG policies can be reflected in a Green Lease

<table>
<thead>
<tr>
<th>Operate on 100% Renewable Energy</th>
<th>Increasing financing commitments</th>
<th>Issuing Green Bonds</th>
</tr>
</thead>
<tbody>
<tr>
<td>Adobe</td>
<td>JPMorgan Chase &amp; Co.</td>
<td>Apple</td>
</tr>
<tr>
<td>AT&amp;T</td>
<td>Goldman Sachs</td>
<td>Bank of China</td>
</tr>
<tr>
<td>Facebook</td>
<td>Bank of America</td>
<td>Barclays</td>
</tr>
<tr>
<td>Google</td>
<td>Citibank</td>
<td>Berlin Hyp</td>
</tr>
<tr>
<td>Ikea</td>
<td>JPMorgan Chase &amp; Co.</td>
<td>Credit Agricole</td>
</tr>
<tr>
<td>Kellogg’s</td>
<td>Wells Fargo</td>
<td>EDF</td>
</tr>
<tr>
<td>P&amp;G</td>
<td></td>
<td>Iberdola</td>
</tr>
<tr>
<td>Starbucks</td>
<td></td>
<td>Morgan Stanley</td>
</tr>
<tr>
<td>Walmart</td>
<td></td>
<td>MTA</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Starbucks</td>
</tr>
<tr>
<td></td>
<td></td>
<td>TSKB</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Toyota</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Vestas</td>
</tr>
</tbody>
</table>
Nixon Peabody / Brookfield Properties: 799 9th Street NW

Nixon Peabody’s primary goals: reflect its brand, demonstrate its commitment to sustainability, promote wellbeing of its employees

- A three-story living wall that reuses mechanical unit condensate water for irrigation was included in the design and construction of a 3-story interconnecting stair. The stair also supports employee communication, health, wellness and mobility.

- DC’s Clean Act Renewable Goals already met by:
  - Total connected lighting load 35% better than DC building code
  - Glass office fronts, daylight harvesting, lighting controls, and motorized shades to maximize natural light and reduce need for electric light
  - 100% LED fixture specification and control sequencing were integral to reducing the lighting load
  - Reduced HVAC energy costs by 21% and supports a 35% reduction in water use through 1.5 gallon per minute (gpm) faucets on pantry sinks and low flow fixtures in restrooms
  - Achieved Platinum under LEED for Commercial Interiors
  - Landlord & Tenant shared values and aligned interests
Representative Green Lease Clauses

A) Pass through clauses: allows LL to pass through energy efficient investment costs to tenants

- Gross versus NNN leases - dealing with the split incentive
- Allowing capital cost pass through from energy efficiency investments to tenants, enables cost-recovery for building owners.
- Can be justified if the capital cost investment has the impact of reducing operating expenses. In modified gross leases or triple net leases, this capital cost passthrough might be incorporated into tenants’ monthly operating expenses.

B) Operations clauses: lease sections which allow the building to operate more efficiently and/or reduce environmental impacts. Examples include:

- Establish MEPS design criteria for tenant improvements to conform with BEPS
- Establish recycling and waste practices
- Set formal building operating hours and temperature ranges.

C) Sustainable purchasing: establishing rules about the types of materials which can be purchased for improving tenant spaces and common-area spaces. Examples include:

- Energy STAR-qualified office equipment, electronics, appliances
- Products containing pre- consumers and post-consumer materials,
- Products containing rapidly renewable materials
- High-efficiency, LED lighting
- Low-or no VOC furniture
- Low or no VOC paints, adhesives, solvents or other

D) Reporting: sharing data on building energy use and progress towards goals through benchmarking or other systems agreed on between the landlord and tenant.

- BEPS will establish benchmarks using Energy Star or other metrics
- Multiple reporting forms are already in use, the District needs to adopt or adapt a form
Achieving the Clean Act Goals: Tenants Have a Role To Play!

Green leases help turn energy efficiency investments into a win-win for both owners and tenants by overcoming split incentives

- A green lease can serve as a representation of the values and importance the landlord and the tenant place on the built environment
- Building Energy Performance Standards (“BEPS”) provides a unique opportunity to introduce energy use and efficiencies and GREEN into all future lease negotiations.
- Tenants control 50% of energy consumption in buildings – without tenant engagement, WE WILL NOT ACHIEVE THESE GOALS
- Making tenant fit-outs sustainable is critical to hitting these goals
- ULI Greenprint has a 10-step process that can help reduce tenant energy use 50%
10 Steps to Energy Efficient Tenant Fit-Outs

ULI’s Tenant Energy Optimization Program (TEOP): a returns-driven, 10-step process to embed energy efficiency decisions into tenant space design and construction

<table>
<thead>
<tr>
<th>Step</th>
<th>Phase</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
<th>8</th>
<th>9</th>
<th>10</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Pre-Lease</td>
<td>Select a team</td>
<td>Select an office space</td>
<td>Set energy performance goals</td>
<td>Model energy reduction options</td>
<td>Calculate projected financial returns</td>
<td>Make final decisions</td>
<td>Develop a post-occupancy plan</td>
<td>Build out the space</td>
<td>Execute the post-occupancy plan</td>
<td>Communicate results</td>
</tr>
<tr>
<td>2</td>
<td>Design and Construction</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>Occupancy</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Renewable Solutions for Residential Units: Owned or Leased

**Passive Energy Features:**
- Sight Configuration
- Natural Ventilation
- Insulated Wall-Systems & Windows
- Overhang Shading
- Solarium

**Active Energy Solutions:**
- Solar Panels Roof, and Windows
- Home Energy Meter
- Geothermal Heat Pumps
- Water Filtration
- Tankless Water Heater
- Solarium
- Overhang Shading
- Storage Batteries
- Small Wind Turbine
- Energy Efficient Lighting
- Electric Car
- Smart Meter and Controls
- Energy Star Appliances

Source: [www diy-home-automation com/](http://www diy-home-automation com/)
STAKEHOLDERS ROLES FOR SUCCESS
NEAR TERM ACTIONS FOR THE BID
Recommended near term actions for DowntownDC BID

Getting Set

- Important to Start Now
  - Setup during the next 30 days is critical
  - Launch a six-month Get Ready for Energy Efficiency campaign immediately

- Communications
  - Begin immediately and continue throughout
  - Develop awareness and knowledge

- Data and analysis
  - Immediately begin collecting, cataloging and analyzing for subsequent use
  - Provide as soon as possible
Recommended near term actions for DowntownDC BID

Member Awareness and Preparation

- **Education**
  - Begin awareness and early education now and evolve offerings as implementation occurs
  - Knowledgeable members can support

- **Benchmarking Assistance**
  - Understand baseline
  - Identify below-median properties, then target with further assistance

- **Energy audit support**

- **Toolkit of possible energy initiative projects**
  - Begin development of toolkits now exploring availability in the industry first

- **Workforce Training**
  - Begin developing programs now and continue until other programs supersede the need
  - Workforce development in building technology and management
  - Help fill a critical need in DC market – skilled building technicians
Recommended near term actions for DowntownDC BID

Implementation and Best Practices

- **Case Studies**
  - Begin outreach to find case studies immediately and continue as technologies evolve or others supplant need

- **Forums for sharing best practices**
  - Workshops
  - Tours
  - Webinars & online content

- **Qualified Service Providers**
  - Assemble list of qualified consultants and contractors

- **Connect Members to Investment Sources**
  - Finance Forum
  - City financial sources (Green Bank, PACE, etc.)
  - Private sources with green experience
  - Fannie Mae Green for multifamily
Recommended near term actions for DowntownDC BID

Engagement and Connections

- Building Energy Performance Standards
  - Much work still to be done
  - Participate in development of the details, to assure things like:
    - Effective but not excessive penalties, in line with 2½-year effective timeline
    - Prescriptive path is well crafted
    - Proper accounting for change of occupancy and increased occupancy

- Advocacy on government structure
  - Streamlined processes
  - A central champion responsible for coordinating all the aspects of BEPS implementation

- Business leader engagement with City government
  - Effective in other cities (e.g.; Boston)

- Tenant engagement
  - Give owners tools to educate and influence occupant behavior
Recommended near term actions for DowntownDC BID

Follow Up

- Continuous Monitoring, Feedback and Improvement
  - From DOEE and City to BID members
  - From BID Members to DOEE and City

- Keep members updated
  - Partner with Task Force members to produce annual reports on the progress of BEPS
Recommended near term actions for DowntownDC BID

Leadership First

- Appoint a BID Sustainability Leader
  - Appoint immediately for a long-term position
  - A strong, experienced professional current on energy efficiency at the building level
  - Coordinate efforts on these many recommended tasks
  - Leadership, ownership and authority to move these programs forward with urgency.
NEAR TERM ACTIONS: DOEE AND CITY
Near term actions

DOEE and the City

- Launch a communications and public relations campaign
- Visibly identify a Clean Energy DC Champion
  - Accountable for accomplishing the Clean Energy Omnibus Bill goals on behalf of the Mayor
  - Demonstrates ownership, a strong advocate, a good listener and a visible, decisive leader
  - Possesses authority and resources to successfully accomplish goals
- Deploy resources now
  - Urgency around implementation of these efforts
- Education and training
  - Ensure sustainability of the Hub, which will need to play a permanent role in implementation
Near term actions

DOEE and the City

- Expediting Processes
  - Unencumbered and clearly communicated to the building industry: demonstrate the urgency and importance the City attributes to this program
  - Streamline, simplify and speed up permitting that supports these goals

- Positive Motivations
  - Incentives will be better motivators for faster and larger change
  - Establish award program to recognize strong performance, create competition and motivation

- Demonstration Projects
  - Demonstration projects of various property types, ages and sizes
  - Focusing on smaller, class B or C and including multi-family and office
  - DOEE, SEU and the Green Bank should provide financial and technical support

- Funding
  - The Green Bank should focus its funding where it is needed most, i.e., smaller buildings, class B or C, affordable multi family housing or with rent controlled units
FEDERAL AND PRIVATE SECTOR PARTNERSHIPS
Federal partnerships

<table>
<thead>
<tr>
<th></th>
<th>DowntownDC BID</th>
<th>Outside</th>
</tr>
</thead>
<tbody>
<tr>
<td>GSA owned space</td>
<td>15.8m SF (19 bldgs.)</td>
<td>20m SF (80 bldgs.)</td>
</tr>
<tr>
<td>GSA leased space</td>
<td>5.3m SF</td>
<td>16.1m SF</td>
</tr>
</tbody>
</table>

- **US General Services Administration (GSA)**
  - Sustainability leader across built and leased portfolios
  - Adopted LEED in 1999
  - Requires Energy Star certification (75 or higher) in leases over 10,000 SF
  - Owns 10 LEED platinum and 49 LEED gold buildings
    - 24% of GSA's owned portfolio, nearly 1/3 historic

- **US Dept. of Energy (DOE) and US Environmental Protection Agency (EPA)**
  - Better Buildings Challenge
  - Green Lease Leaders
  - Energy Star
Federal partnerships

- Help establish parameters for BEPS for different property types
- Share models and information to support movement toward sustainability targets
  - *GSA Proving Ground program*: Pilots and assesses building technologies and identifies those that have broad deployment potential
  - GSA’s Pilot-to-Portfolio Program (P2P): Supports deployment of energy saving technologies at different parts of the building lifecycle
  - *GSA High Performance Building Certification System Review*: Assesses building performance assessment systems (e.g. LEED, Living Building Challenge)
  - Thought leadership

- Local information exchange
  - Invite federal agencies onto BEPS implementation task force

- Partner on projects
  - GSA could be an anchor customer for a micro-grid pilot
Private sector partnerships

- Leveraging private sector partnerships
  - DowntownDC BID can play a critical role
  - Can also strengthen relationships between the private sector and the DC government
  - Ensure sufficient private sector members on the initial BEPS task force that will convene in October
  - The Hub can also facilitate partnerships between DOEE and federal agencies, and could work independently or with groups like the DowntownDC BID to share this information

- DOEE’s Clean Energy Champion should serve as a node for information exchange and relationship formation, identifying ways to align private and federal interests with District priorities
POLICY AREAS FOR FOCUS
DC Government actions to facilitate BEPS

- **Potential requirements:**
  - New construction to be fossil-free
  - Submetering of commercial tenants

- **Coordinating codes, zoning, & other regulations:**
  - Remove code impediments to energy efficiency
  - Foster more energy efficiency at the time of standard renovations
DC Government actions to facilitate BEPS

- Improved reporting:
  - More thorough analysis of citywide benchmarking scores
  - Expanded visualization of building energy scores
How DC can help make ZNE cost effective

- **Subsidies/ cost reductions:**
  - Expand funding for ZNE designs
  - Tax abatement for the value of ZNE improvements

- **Allowances:**
  - Relax height limits
  - Relax zoning impediments to better envelopes and solar
  - Expedited permitting
  - Allow rezoning to higher and be
Policies on the horizon to accelerate progress toward DC’s goals

**Next 12 to 18 months:**
- Purchasing consortium for clean energy and energy efficient products, appliances and services
- A BID-wide or citywide-wide energy efficiency trading system

**Next 3 to 5 years:**
- Carbon as an alternative compliance path for BEPS
- Limiting embodied carbon in new construction
CONCLUSIONS
Conclusion

“How can the DowntownDC BID and building owners cost effectively meet DC’s sustainability requirements?”

- Yes the 2032 goals are achievable, the journey beyond 2032 is more unknown and difficult
- We have shared tactical information at the building level evidencing how existing buildings can become highly energy efficient
- Our key messages are:
  - Actions must be taken immediately; yesterday is not too soon
  - Broad and frequent communication is essential
  - Everyone must be engaged, collaborating, and working to achieve solutions that are fair and motivating to everyone
- The BID can play an important role
- ULI will also be here to help
- Thank you
DC Vision 2050: Leading Green Economy
Effective Strategy and Plan for Building Owners to Achieve Goals

WASHINGTON, DC
ULI ADVISORY SERVICES

JULY 21-26, 2019