The Pittsburgh 2030 District is an internationally recognized, locally driven initiative that supports building owners and managers as they strive toward 50% reductions in energy use, water consumption, and transportation emissions by 2030, while improving indoor air quality. The District connects 102 Property Partners with 43 Community and Resource Partners, driving industry-leading performance through peer-to-peer learning, technical trainings, and data benchmarking. The District leads all 19 international 2030 Districts with 81.7 million square feet committed, and has collectively saved $85.4M in energy and water costs since 2012, while avoiding 494,400 metric tons of CO₂. The Pittsburgh 2030 District is a private-public-nonprofit partnership facilitated by Green Building Alliance (GBA).

**506 Buildings Committed**

**81.7M Square Feet**

**74.3% of the District Committed**

**102 Property Partners**

**12.0% Energy Reduction**

**14.5% Water Reduction**

**$26.7M Dollars Saved**

The Pittsburgh 2030 District launched Downtown in 2012 with 61 committed buildings, encompassing core commercial properties and public facilities such as BNY Mellon Center and the David L. Lawrence Convention Center. Nearly six years later, the District has expanded into Oakland, Uptown, and the Northside, and includes 506 properties spanning higher education, healthcare, hospitality, and multifamily residential. By pairing development density with a diverse set of partners, the Pittsburgh 2030 District sets higher building standards for all, while driving market transformation in the region’s largest economic centers.
PITTSBURGH LEADS ALL 2030 DISTRICTS WITH 21% OF TOTAL COMMITTED SQUARE FEET

The Pittsburgh 2030 District is part of the international 2030 Districts Network, which sustains 19 Established and four Emerging Districts. Pittsburgh was the third 2030 District formed and represents 21% of all committed square feet in North America. Given its experience, the Pittsburgh 2030 District frequently advises other 2030 Districts, in addition to supporting cities interested in creating their own building performance programs.

WHAT ARE THE 2030 CHALLENGE GOALS?

The Pittsburgh 2030 District follows the 2030 Challenge for Planning, a framework created by Architecture 2030 to drastically improve buildings’ environmental impact by 2030. With separate goals for new construction and existing buildings, the 2030 Challenge sets rigorous but achievable reduction targets in five-year increments. New construction and major renovation projects commit to carbon neutrality by 2030, while existing buildings pursue 50% reductions in energy use (below national baselines). Both new and existing buildings commit to 50% reductions in water use and transportation emissions (below regional baselines).

DEFINING CARBON NEUTRALITY

The 2030 Challenge asks all new buildings to achieve carbon neutrality, defined as no net annual production of greenhouse gases. Carbon neutrality can involve several different conservation strategies paired with on-site and off-site renewables. In theory, carbon neutrality can be achieved by purchasing 100% off-site renewable energy. The 2030 Challenge, though, requires a specific approach to net zero carbon. All new buildings must preliminarily achieve an 80% reduction in energy consumed, derived either from conservation measures or on-site renewable energy production (such as solar arrays or a wind turbine). Properties then address the new, smaller energy load with a combination of off-site renewable energy sources and renewable energy certificates (RECs). Existing buildings can count 10% off-site renewable energy and RECs as part of their total 50% energy reduction.

If the 2030 Challenge's formula seems specific, consider that current renewable energy production is not large enough to cover existing national energy usage. By prioritizing overall energy reduction, a larger percentage of the region’s energy load can be supplied by renewable sources.

THE 2030 DISTRICT PROVIDES PITTSBURGH WITH BENCHMARKS, RESOURCES, AND AGGRESSIVE GOALS THAT MOVE US TOWARD MORE EFFICIENT BUILDING OPERATIONS AND A HEALTHIER CITY.

JEREMY WALDRUP
President and CEO
Pittsburgh Downtown Partnership

A PERFORMANCE-BASED MODEL

With 25 years of green building success, Pittsburgh boasts three of the first LEED-certified buildings, in addition to early adoption of the Living Building Challenge and Passive House Standard. However, Pittsburgh also maintains a sizable aging building stock, for which these certifications may be financially and logistically inaccessible. In strategizing how to create a more sustainable future, GBA adopted the 2030 District model which measures building operations and performance (as opposed to only design and construction), encouraging building owners to make incremental improvements as resources permit.

Of equal importance, buildings’ characteristics are considered when calculating reduction targets. No matter the stage of a building’s life, every property owner and manager can improve operational efficiency while learning from those undertaking similar efforts.

In addition to setting tangible goals, the 2030 District model encourages participants to envision the impact of their collective actions. Property Partners build a robust peer network that cultivates collaboration across diverse sectors of influence, including community organizations, utilities, designers, technology providers, and government officials.
To measure progress toward 2030 Challenge goals, the Pittsburgh 2030 District relies on comprehensive data collection and analysis, aggregating individual properties’ performance to find District reductions in energy, water, and transportation emissions, in addition to improvements in indoor air quality. Each building’s performance is determined by pairing contextual factors with metric-specific data as reflected in Table 1. While property-level performance is held in confidence, the aggregated data set provides a detailed analysis of citywide resource use.

### Baselines & Performance Calculations

Determining a building’s reduction in resource use requires an initial point of comparison, known as the building’s baseline. Using the best available data, each building is assigned an initial baseline value, which takes into account various features depending on the metric. In cases with specific use types, such as public event facilities, custom baselines are developed referencing documented past use.

<table>
<thead>
<tr>
<th>Energy</th>
<th>Water</th>
<th>Transportation</th>
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<tbody>
<tr>
<td><strong>Baseline Type</strong></td>
<td>National baseline</td>
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<tr>
<td><strong>Baseline Considerations</strong></td>
<td>Climate zone, Building use type(s), Building size, Occupancy, Weather</td>
<td>Building use type(s), Building size</td>
<td>Location (Downtown or Oakland)</td>
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<tr>
<td><strong>Impact Metric</strong></td>
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<td>Annual water use intensity (WUI)</td>
<td>Carbon emissions per person trip per year</td>
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<td><strong>Measurement Units</strong></td>
<td>kBtu/square foot/year</td>
<td>gallons/square foot/year</td>
<td>kg CO₂/ person trip/year</td>
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<tr>
<td><strong>Tracking Method</strong></td>
<td>ENERGY STAR Portfolio Manager</td>
<td>ENERGY STAR Portfolio Manager</td>
<td>Make My Trip Count regional survey</td>
</tr>
<tr>
<td><strong>Reporting for 2017 Performance Year</strong></td>
<td>360 buildings, 70.8M square feet</td>
<td>225 buildings, 50.7M square feet</td>
<td>8.5% of Downtown commuters (2015)</td>
</tr>
</tbody>
</table>

Table 1

+ custom baselines are used for buildings with unique use types
REDUCING ENERGY BY WORKING TOGETHER

In 2017, properties improved their performance to 12.0% below baseline. While reduction values provide critical benchmarks for the 2030 Challenge, the percentage alone does not capture the scale of the District’s progress. As the number of committed buildings increases, the District can avoid significantly more energy on a yearly basis. For example, in 2017 properties avoided 1.1 billion kBtu, an increase of 151 million kBtu over last year. By comparison, 2017 energy savings eclipsed the District’s initial performance year by more than four times.

Property Partners also continue to match their reductions with commitments to renewable energy sourcing. In 2017, buildings purchased more than 674 million kBtu of off-site renewable energy, representing 7.9% of overall energy use reported. However, the 2030 Challenge only recognizes 10% of properties’ off-site renewable energy purchases in reduction calculations. Thus for the purpose of this report, off-site renewable energy represents 2.9% of total energy used.

The high performance of the District’s largest offices is linked to a number of factors, including their economies of scale, renovation schedules, skilled building operations staff, and sophisticated building automation systems. As investment assets, buildings prioritize operational efficiencies, and can capitalize on significant facility upgrades.

The Pittsburgh 2030 District’s reported energy reduction illustrates the aggregate performance for 2017, but a closer examination reveals that Pittsburgh’s largest office buildings are accelerating that progress. With 30 properties over 200,000 square feet, this cohort is currently 26.9% below baseline, with 19 buildings already achieving their interim 2020 goal of 20% reduction below baseline. Office buildings make a significant contribution to the Pittsburgh 2030 District’s environmental impact, while their practices create new standards for the region’s entire real estate market.

As Class A and B real estate, these buildings shape the market-wide property investment standards. Building classification differs within each regional market, and local properties compete based on construction, aesthetic fixtures, and amenities. In turn, these ratings determine property value, and ultimately lease occupancy. When 2030 District partners install innovative lighting, control systems, or elevators, properties seeking to maintain their status will need to match these features. These Property Partners share their business cases (often with facility tours) within the Pittsburgh 2030 District network, connecting other organizations to advanced service providers, consultants, and research.

As building benchmarking legislation becomes standard in states around the country, the mandated disclosure of energy and water usage will create further transparency in regional real estate markets. In 2016, Pittsburgh became one of more than 20 local governments to require public disclosure of utility data. Tenants and prospective buyers will be able to compare building performance, and properties will be further incentivized to implement sustainability upgrades.
RISING RETURN ON INVESTMENT DRIVES WATER EFFICIENCY PROJECTS

Given the region’s dependable watershed and traditionally low water rates, water efficiency has historically been a lower priority for partners. However, significant increases in local water and sewage rates are compelling building owners and managers to reevaluate their water conservation strategies.

$3.9M  164M
DOLLARS SAVED  GALLONS AVOIDED

For 2017 alone, partners avoided 163,613,400 gallons of water, resulting in a $3.9 million savings. This is equivalent to a 14.5% reduction, compared with 7.4% in 2016. With rates expected to increase another 48% by 2020, returns on investment for water reduction projects will continue to increase.

TRANSPORTATION

Transportation is perhaps the most visible cause of carbon emissions, and one of the most personal to control. In Pittsburgh, vehicular traffic accounts for 18% percent of overall greenhouse gas emissions (about half of which is passenger vehicles), and releases approximately 833,000 tons of CO₂ into the atmosphere annually. Transportation choices are responsible for 22% of the region’s air pollution, for which Pittsburgh has consistently ranked among the worst in the country.

QUANTIFYING REGIONAL MOBILITY

To measure progress toward the 2030 Challenge’s transportation emissions reduction goal, GBA led the first multi-neighborhood commuter survey in the region. Launched in 2015, the Make My Trip Count (MMTC) survey generated 20,710 responses, providing commuter origination zip code, destination, and primary, secondary, and tertiary commuting modes.

As opposed to more general regional transportation surveys, MMTC provides each building with its tenants’ mobility choices, allowing organizations to explore improvements such as employee transit benefits, bike infrastructure, and flexible work schedules. The survey has also informed regional transportation decisions, including multimodal mobility plans, parking requirement reductions, and future transit expansions.

MAKE MY TRIP COUNT SURVEY

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35% OF RESPONDENTS TAKE
PUBLIC TRANSPORTATION AS THEIR
PRIMARY MODE OF COMMUTE TO
DOWNTOWN AND OAKLAND

Benchmarked against the Southwestern Pennsylvania Commission’s 2013 modeled baseline, the MMTC responses for Downtown demonstrated a 24.2% reduction. The Oakland baseline is in development for 2018 release. To capture shifts in commuter patterns, GBA and its transportation partners are planning a 2018 Make My Trip Count survey, which will track new trends in mobility such as ride sourcing, bike sharing, and electric vehicles.
QUANTIFYING INDOOR AIR QUALITY: ADAPTING INTERNATIONAL STANDARDS FOR LOCAL IMPLEMENTATION

Academic studies widely illustrate indoor air quality’s (IAQ) impact on physical and mental health, and improvements have been linked to decreased absenteeism, increased productivity, and higher employee retention. Since IAQ is measured through multiple indicators, there is neither a universally accepted evaluation nor mandated standard for buildings.

AMERICANS ON AVERAGE SPEND 90% OF THEIR TIME INDOORS

In partnership with the University of Pittsburgh’s Mascaro Center for Sustainable Innovation, the Pittsburgh 2030 District is developing a scalable protocol that quantifies IAQ as a 2030 Challenge performance metric.

To ground the protocol in local context, eight buildings participated in a three-year IAQ pilot modeled on the Environmental Protection Agency’s Building Assessment Survey and Evaluation. The study included on-site testing, HVAC equipment evaluation, and improvement recommendations. Findings from the initial and post-intervention analyses, together with best practices from third-party rating systems such as LEED and WELL, informed the creation of the Pittsburgh 2030 District’s first IAQ survey for the 2017 performance year.

As of publication, representatives of more than 300 buildings took the 26-question survey, covering considerations of design, construction, operations, and maintenance. Survey results will be evaluated to generate a Pittsburgh 2030 District Indoor Air Quality baseline and a corresponding reporting mechanism to track annual performance.

PITTSBURGH 2030 DISTRICT INDOOR AIR QUALITY: PRELIMINARY 2017 SURVEY RESULTS

CONTINUOUS/ANNUAL TESTING FOR AIR POLLUTANTS

OCCUPANCY SURVEYS ADMINISTERED ANNUALLY

ALL VACUUMS HAVE HEPA FILTERS

ALL AIR INTAKES LOCATED TO AVOID AIR POLLUTION

ALL ENTRYWAYS HAVE WALK-OFF MATS

PERCENT OF BUILDINGS

10% 20% 30% 40% 50% 60% 70% 80% 90% 100%

BEING A 2030 DISTRICT PARTNER HAS MOTIVATED OUR TEAM TO PURSUE EXCELLENCE IN THE HISTORIC RENOVATION OF OUR MUSEUM LAB, MORE THAN 40 YEARS IN THE MAKING. THE PARTNERSHIP ENABLED US TO REACH FOR GOALS AND GALVANIZE FINANCIAL SUPPORT BEHIND A ‘GREAT’ PROJECT, RATHER THAN ‘GOOD ENOUGH.’

CHRISTEN CIESLAK
Project Manager, PE, LEED AP
Children’s Museum of Pittsburgh
With six years of progress, the Pittsburgh 2030 District has helped define city standards for building performance through several landmark policies. In 2016, Pittsburgh’s first sustainable development rubric, the p4 Performance Measures, built its Energy Measure on the 2030 Challenge goals, incorporating the District’s baselines, calculation methodologies, and documentation procedures. In p4’s first policy application, both the Uptown EcoInnovation District and Riverfront zoning overlays specifically reference the Energy Measure in their development incentives (2017 and 2018 respectively).¹²

Beyond building-scale application, the 2030 District is shaping the future of the region. The Pittsburgh Climate Action Plan 3.0 (anticipated in 2018) adopts 2030 Challenge goals as the city’s guiding objectives, specifically calling out reductions in energy, water, and transportation emissions as a means to carbon neutrality. As the District transforms market expectations, multi-parcel sites like the 28-acre Lower Hill are voluntarily committing to 2030 Challenge goals by incorporating reduction targets into their Preliminary Land Development plans and developer agreements.¹³

The Pittsburgh 2030 District also directly partners with local government to bring energy-saving technologies to public facilities. In collaboration with the City of Pittsburgh, the Pittsburgh Parking Authority, the Sports & Exhibition Authority, and the Urban Redevelopment Authority, GBA launched the Pittsburgh Green Garage Initiative (PGGI) in 2014, upgrading lighting and controls in nine parking garages over three years. With state funding, GBA worked with the consortium to monitor performance, resulting in average energy reductions of 52% and over $300,000 in savings for 2017 alone. PGGI partners are expanding the approach to more garages and considering future innovations in renewables and efficiency.
All our partners are extremely talented individuals, and the 2030 District gives us the same goals to achieve. Instead of competing with each other, we are able to work together to save energy and water, all while making the city better for everyone.

BRAD OTT
Vice President, Commercial Operations
Faros Properties

A PEER-TO-PEER NETWORK
The Pittsburgh 2030 District’s effectiveness stems from its diverse network of partners and sponsors. Spanning more than 25 professional disciplines, this collaborative brings unprecedented transparency and connectivity to the city’s most influential sectors. Partners convene monthly in a closed-door meeting featuring presentations from technical experts, service providers, and building owners. The sessions provide space for peer inquiry and analysis, allowing partners to share challenges and best practices with others who might normally be competitors. In more than 15 events throughout the year, partners also gain direct access to policymakers, utility companies, and financial organizations.

INDIVIDUAL & TAILORED EVALUATIONS
Beyond peer collaboration, Pittsburgh 2030 District Property Partners receive a confidential annual performance report that analyzes their progress toward 2030 Challenge goals. Reports can demonstrate the business case for key performance upgrades and present clear evidence to evaluate returns on investment. GBA works to consult with every Property Partner individually, identifying present opportunities and future investments critical to achieving individual reduction targets. Where possible, reports also compare a building’s performance to similar, anonymized local buildings, allowing partners to contextualize their progress with their peers.

A SELECTION OF TOPICS COVERED:
SMART CITIES & REGIONAL TRANSIT
RETRO-COMMISSIONING
LED RETROFITS
BASELINING ENERGY PERFORMANCE
STORMWATER MANAGEMENT
MICROGRIDS & COMMUNITY-SCALE ENERGY
PITTSBURGH CLIMATE ACTION PLAN
RENOVATION FINANCE & MANAGEMENT
SUSTAINABILITY MASTER PLANNING

145 PROPERTY, COMMUNITY & RESOURCE PARTNERS
30 TRAININGS & PRESENTATIONS
1,167 EVENT ATTENDEES
25+ SECTORS
### 2030 District Affiliate Property

The 2030 District is opening the 2030 Challenge to the entire region. Any existing, newly constructed, or emerging property in Western Pennsylvania can now become a 2030 District Affiliate, committing to the same goals while benefitting from the District’s network and expertise.

### Become a 2030 District Property Partner

If you own or manage a property in the Pittsburgh 2030 District boundary, join our network of 102 organizations and 506 buildings by becoming a Property Partner! Simply complete a commitment to the 2030 District boundary, join our network of 102 organizations and 506 buildings by becoming a Property Partner! Complete the online form at https://2030district.com/commitment to take the first step.

### Attend the Bridge to 2030 Educational Series

GBA’s Bridge to 2030 educational series invites all professionals in the built environment to explore topics integral to the Pittsburgh 2030 District – energy, water, transportation, indoor air quality, and financing. Held four times annually, the series features presentations from technical experts, followed by interactive discussion and networking.

### Green Building Alliance (GBA) advances innovation in the built environment by empowering people to create environmentally, economically, and socially vibrant places. Founded in 1993, GBA is an independent 501 (c) 3 nonprofit organization — and one of the oldest regional green building organizations in the United States. GBA proudly serves Pittsburgh and the 26 counties of Western Pennsylvania, with stakeholders across the mid-Atlantic, United States, and the world.

### References

1. Avoided energy costs were calculated using an average cost of $0.09/kWh for electricity, $8.95/GJ for gas, $1.36/MMBtu for steam, $0.34/hour for chilled water, and $1.78/Gallon for hot water. Avoided water and sewage costs were calculated using an average cost of $0.024 per gallon.
4. Data collected from respective cities public disclosure of 2016 energy use for office buildings larger than 200,000 square feet.

### Community Partners

GBA’s Bridge to 2030 educational series invites all professionals in the built environment to explore topics integral to the Pittsburgh 2030 District – energy, water, transportation, indoor air quality, and financing. Held four times annually, the series features presentations from technical experts, followed by interactive discussion and networking. Keep an eye on GBA’s calendar and newsletter for regular updates.

### References

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