

Boston Planning & Development Agency

Smart Utilities Policy for Article 80 Development Review – October 2020 Update

Background

The Boston Planning & Development Agency (“BPDA”) has worked in close collaboration with numerous internal and external stakeholders –including the Mayor’s Office of Streets, Transportation and Sanitation, the Mayor’s Office of Environment, Energy and Open Space (“EOOS”), the City of Boston Department of Information Technology (“DoIT”), the City of Boston Public Works Department (“PWD”), the Public Improvement Commission (“PIC”), the Boston Water and Sewer Commission (“BWSC”), the City of Boston Transportation Department (“BTD”), the Mayor’s Office of New Urban Mechanics (“MONUM”), and numerous developers, architects, engineers, and technology providers-- to develop a new model for integrated planning among energy, transportation, water, and telecommunications utilities. The resulting *Boston Smart Utilities Program* (“BSU Program”) aims to transform and improve the “business-as-usual” model of utility design, planning, and coordination by improving efficiencies in the process and encouraging the deployment of new technologies. With coordinated planning and improved technologies, utility services can be made more affordable, resilient, equitable, and sustainable.

Four key products of the BSU Program, which began in 2016, include a *Baseline Report*, a *Cost Benefit Analysis*, the *Smart Utility Standards*, and a new policy calling for the incorporation of Smart Utility Technologies (“SUTs”) into Proposed Projects under Article 80 Development Review and Approval of the Boston Zoning Code (“Proposed Projects”). The first three of these work products can be found at: <http://www.bostonplans.org/smart-utilities>. The fourth work product, the *Smart Utilities Policy for Article 80 Development Review* (the “Smart Utilities Policy”), is contained herein.

The *Baseline Report* analyzes the cost of doing “business-as-usual” – namely, planning and constructing utilities using conventional approaches. The analysis used the area contemplated in the PLAN: South Boston Dorchester Avenue Planning Initiative as the analytical pilot project area.

The *Cost Benefit Analysis* compares business as usual approaches with multiple SUTs and concludes that many SUTs are financially feasible and cost effective at various scales of real estate development under current market conditions.

The *Smart Utility Standards* set forth guidelines for planning and integration of SUTs with existing utility infrastructure in existing or new streets. The *Smart Utility Standards* are intended to serve as guidelines for developers, architects, engineers, and utility providers for planning, designing, and locating utilities.

The *Smart Utilities Policy* presented herein describes which SUTs will be required for Proposed Projects, based on certain square footage thresholds and/or other specifications, the Cost Benefit Analysis, the lessons learned from the first two years of the policy's implementation, and feedback from real estate developers, architects, and engineers.

Policy Statement

Proposed Projects subject to Article 80B – Large Project, Article 80C – Planned Development Area, and/or Article 80D - Institutional Master Plan review shall incorporate the applicable SUTs contemplated within this policy as described below into the infrastructure design and planning process of utility infrastructure for water (including but not limited to sewage and stormwater), energy (including but not limited to gas, electricity, and steam), telecommunications, and transportation services. Proposed Project proponents should utilize the most recent *Smart Utility Standards* provided by the Boston Planning & Development Agency (“BPDA”) and the City of Boston (“City”) (available at <http://www.bostonplans.org/smart-utilities>). This policy will be evaluated every two years to consider modifications to the policy in terms of applicable development thresholds, applicable SUTs, and any relevant changes to the design standards of the *Smart Utility Standards*.

Definitions

To be clear about what each of the SUTs involves, the following definitions are provided. More detailed standards and specifications will be developed for certain technologies by other City Departments – for example, PIC and PWD will adopt standards for the Telecommunications Utilidor and the Smart Street Lights infrastructure.

Adaptive Signal Technology - Adaptive Signal Technology (“AST”) utilizes intelligent signals, traffic cameras, pavement sensors, and visual monitoring equipment as part of a network to manage traffic flow in real-time of all transportation modes, including buses, pedestrians, and bicycles. These technologies are used to reduce wait time and facilitate throughput and safety at intersections.

District Energy - District Energy systems produce steam, hot water, and/or chilled water (“thermal services”) at a central plant. The steam or water is then piped underground to individual buildings for space heating, domestic hot water, and/or air conditioning. Buildings served by a district energy system do not need their own boilers, furnaces, chillers, and/or air conditioners, and thus have lower capital and maintenance costs and more usable floor area. District energy provides opportunities to reduce energy use, energy cost, and greenhouse gas (“GHG”) emissions, as well as an opportunity to increase on-site resilience through local energy generation.

District Energy Microgrid - An energy system that includes both the thermal services of District Energy (see “District Energy” definition) and the electrical generation and distribution services of a Microgrid (see “Microgrid” definition). One way to achieve a District Energy Microgrid is through a combined heat and power (“CHP”) system in order to achieve better energy efficiencies. CHP refers to the generation of electricity on-site and the capturing of excess heat of that process (which would otherwise be wasted) to provide useful thermal energy – such as steam or hot water – for space heating, cooling, domestic hot water, and industrial processes. District Energy Microgrid systems can also rely entirely on renewable sources of energy. District Energy Microgrid systems can be designed and implemented in a modular form, serving an initial energy load and progressively adding modules as the energy loads increase.

District Energy Microgrid Master Plan – Based on the analysis provided by the Feasibility Assessment (see definition), the District Energy Microgrid Master Plan will provide a detailed plan and conceptual layout illustrating and describing the District Energy Microgrid generation and distribution system(s) that will serve the Proposed Project at full buildout. The Master Plan shall include the timing and phasing of all District Energy Microgrid system components as they relate to the timing and phasing of the proposed development, including modular buildout of the District Energy Microgrid. Where phasing is appropriate, the Master Plan shall define components of the Proposed Project that should be designed to be District Energy Microgrid Ready (see definition). The District Energy Microgrid Master Plan should quantify Proposed Project benefits in terms of a) energy supply resiliency, b) reduced energy use, c) reduced GHG emissions, and d) cost reduction to end users. The District Energy Microgrid Master Plan shall also describe any potential impacts on the public way due to physical system constraints. The District Energy Microgrid Master Plan must be signed by a Licensed Professional Engineer with substantial experience designing and constructing District Energy Microgrid systems.

District Energy Microgrid Ready – As established in the District Energy Microgrid Master Plan, where modular phasing of a District Energy Microgrid system is appropriate as it relates to the phasing of a development, District Energy Microgrid Ready design may include a) installing a point of common coupling (“PCC”) within the development to allow “islanding” the District Energy Microgrid from the electric utility grid; b) to the extent that new streets are to be constructed adjacent to the Proposed Project as part of the requirements for the development, constructing the District Energy Microgrid distribution system that will ultimately traverse these streets; c) installing building heating and cooling systems in all phases of the Proposed Project that are compatible with a District Energy system; d) designing buildings in the development such that they can easily connect to the District Energy Microgrid system; and/or e) designing mechanical rooms in all buildings with sufficient space to accommodate for future equipment that will be required either to connect to the larger District Energy Microgrid system and/or to facilitate District Energy Microgrid service within the building.

Feasibility Assessment for District Energy Microgrid – A Feasibility Assessment is a technical and economic evaluation of the applicability, scope, nature, and extent of a District Energy Microgrid for a Proposed Project, including whether District Energy, a Microgrid, or a

District Energy Microgrid are appropriate on the Proposed Project. The Feasibility Assessment should favor advanced energy systems for clusters of buildings energized by renewable sources of energy. While many policies and programs led by other teams in the City focus on solutions for individual buildings, the Smart Utilities District Energy Microgrid Feasibility Assessment is an opportunity for Proposed Project proponents to explore enhanced emissions reductions, energy efficiency, and energy resilience through the synergy of clusters of buildings. Factors to be considered in the assessment include, but are not limited to, utility load profiles, business as usual case, definition of economic parameters, physical system constraints, regulatory constraints, screening analysis, construction cost and schedule, operations and maintenance schedule and an economic model. The Feasibility Assessment should describe the Proposed Project's goals regarding: a) energy supply resiliency; b) reduced energy use; c) reduced GHG emissions; and d) cost reduction to end users, and explain how the proposed District Energy Microgrid systems can help achieve these benefits. The Feasibility Assessment must be signed by a Licensed Professional Engineer with substantial experience designing and constructing District Energy Microgrid systems.

Green Infrastructure - Green Infrastructure is an approach to water management that strives to mimic natural processes and includes policies, planning activities, and infrastructure implementation that assist in absorbing, delaying, detaining, and treating stormwater. Benefits of Green Infrastructure include but are not limited to reduction of flood risk and pollution downstream, and mitigation of urban heat island effect. The *Boston Complete Street Guidelines 2013* provide additional information on various green vegetated stormwater management systems (stormwater/bioretention planters, rain gardens, etc.), as well as information on permeable paving materials. Green Infrastructure considered in the BSU Program includes: bioretention basins and planters, infiltration chambers, tree pits/trenches, dry wells, and permeable paving.

Microgrid - A Microgrid is an electricity generation and distribution system generally serving multiple buildings that can be operated in a controlled, coordinated way with the main power grid or, as needed, independently when disconnected from the main power grid (in "island mode"). Microgrids are composed of: a) power source(s); b) a power management system; c) electricity consuming devices; and d) a utility connection. Microgrids may also include an energy storage system. Microgrids provide opportunities for resiliency in the face of weather or other emergencies that affect the main power grid. Microgrids also present opportunities to improve power quality, flexibility, and reliability by integrating and optimizing various sources of energy, including renewable energy and battery storage.

Telecommunications Utilidor – The Telecommunications Utilidor ("Telecom Utilidor") is an underground conduit duct bank that houses all telecommunication assets. By unifying all the telecommunication assets in one Telecom Utilidor, street disruptions can be significantly decreased for telecommunication buildout, as well as when subsequent providers want to add assets. Through coordination, buildout can be more cost effective for all stakeholders.

Telecom Utilidor Corridor of Interest – A Telecom Utilidor Corridor of Interest refers to a street network within a defined geographical area that has been identified, in coordination with PIC and PWD, as a strategic location for the deployment of a Telecom Utilidor. A Telecom Utilidor Corridor of Interest may also be identified through BPDA-led planning initiatives (such as the PLAN: South Boston Dorchester Avenue) where significant real estate development is expected, accompanied by the reconstruction of existing streets and/or the development of new streets.

Traffic/Transit/Bike/Pedestrian Corridor of Interest – A Traffic/Transit/Bike/Ped Corridor of Interest refers to a street network area that has been identified, in coordination with BTD, as a strategic location for multimodal system improvements. Examples of such corridors of interest include: a) the Active Transportation or Bus Rapid Transit program led by BTD, which may require or benefit from infrastructure for smart technology along the route, b) telecom shadow conduit networks that can be used to connect traffic signals that are currently unconnected to the BTD control room, and c) street networks identified for the deployment of Adaptive Signal Technology and related infrastructure.

Applicable Development Review Threshold Criteria

The following thresholds and specifications apply:

For Proposed Projects at or above 1.5 million square feet of floor area:

1. The BPDA shall, as part of Article 80 Development Review, recommend a Feasibility Assessment for a District Energy Microgrid. If the Feasibility Assessment, reviewed and approved by the BPDA, demonstrates that a District Energy Microgrid is feasible, then a District Energy Microgrid Master Plan shall be prepared. The Proposed Project will be expected to implement the District Energy Microgrid Master Plan. If, at a later date, the Proposed Project proponents wishes to amend the approved Article 80 development plans, the corresponding District Energy Microgrid Master Plan must also be amended to reflect any changes in Proposed Project phasing, configuration, land use mix, and/or intensity of use.

For Proposed Projects a) at or above 1.5 million square feet of floor area, b) adding or altering road surface in excess of 0.5 miles of roadway, or c) within a Telecom Utilidor Corridor of Interest:

2. The BPDA and PIC shall, as part of their review process, recommend the incorporation of a Telecom Utilidor. If a Telecom Utilidor is not incorporated into the Proposed Project plans, the Proposed Project proponents shall demonstrate to the BPDA and PIC how other technologies to be incorporated into the Proposed Project will provide comparable or superior benefits in terms of mitigating and/or reducing street disruptions, yielding more efficient use of underground space, and promoting more equitable access to telecom infrastructure.

For all Proposed Projects at or above 100,000 square feet of floor area:

3. The BPDA, in consultation with BWSC, shall recommend the use of Green Infrastructure to retain, on site, a volume of runoff equal to 1.25 inches of rainfall times the total impervious area, prior to discharge, and in compliance with any applicable BWSC stormwater mitigation requirements. It shall be the goal of this Smart Utilities Policy to integrate Green Infrastructure measures in addition to infiltration chambers.

For Proposed Projects satisfying other threshold criteria:

4. **For Proposed Projects in proximity to a Traffic/Transit/Bike/Pedestrian Corridor of Interest**, the BPDA, in consultation with BTD, shall recommend the incorporation of technology or infrastructure, consistent with any applicable BTD standards or guidelines, that support the Traffic/Transit/Bike/Pedestrian Corridors of Interest.
5. **For all Proposed Projects making right-of-way improvements that result in sidewalk reconstruction**, the BPDA and PIC shall recommend the installation of empty conduit for future electric and fiber optic services—in addition to the conduit installed to support street lights, consistent with any applicable PWD standards or guidelines.

Timing in the Article 80 Process

The BPDA will publish guidance concerning the documentation needed at different stages of development review and permitting relative to the *Smart Utilities Policy* on the BSU Program website (<http://www.bostonplans.org/smart-utilities>), including but not limited to any relevant Smart Utilities Checklists, the request of Utility Site Plans to guide the review process, and outlines of the District Energy Microgrid Feasibility Assessment and District Energy Microgrid Master Plan. Proposed Project plans will be reviewed for integration of applicable SUTs during the following stages:

- A. **With the Project Notification Form (“PNF”), Notice of Project Change (“NPC”), or other initial filing**, provide documentation of the integration of applicable SUTs, in accordance with the *Smart Utility Standards*, into the design and planning of the Proposed Project via diagrams, plans, analyses, and descriptions to make clear how these will be integrated into the overall Proposed Project. Describe all immediate and long-term planning, design, construction, and maintenance strategies that will be employed to avoid, eliminate, or mitigate the adverse impacts of utility construction. Consideration of SUTs does not need to be limited to those described in the *Smart Utility Standards* or *Smart Utilities Policy for Article 80 Development Review*.
- B. **During the Article 80 Development Review and prior to Article 80 approval by the BPDA Board**, provide updated documentation of the integration of applicable SUTs, in accordance with the *Smart Utility Standards*, into the design and planning of the

Proposed Project via diagrams, plans, analyses, and descriptions to make clear how these will be integrated into the overall project. As requested by the BPDA or other city agency, descriptions should include immediate and long-term planning, design, construction, and maintenance strategies that will be employed to avoid, eliminate, or mitigate the adverse impacts of utility construction. Consideration of SUTs does not need to be limited to those described in the *Smart Utility Standards* or *Smart Utilities Policy*.

- C. **Prior to filing an application for a building permit**, provide updated documentation of the integration of applicable SUTs, in accordance with the *Smart Utility Standards*, into the design and planning of the Proposed Project via diagrams, plans, analyses, and descriptions to make clear how these will be integrated into the overall project. As requested by the BPDA or other city agency, descriptions should include immediate and long-term planning, design, construction, and maintenance strategies that will be employed to avoid, eliminate, or mitigate the adverse impacts of utility construction. Consideration of SUTs does not need to be limited to those described in the *Smart Utility Standards* or *Smart Utilities Policy for Article 80 Development Review*.
- D. **Prior to applying for a Certificate of Occupancy and final inspection**, provide updated documentation of the integration of applicable SUTs, in accordance with the *Smart Utility Standards*, into the construction of the Proposed Project via diagrams, plans, analyses, and descriptions to make clear how these were integrated into the overall project to avoid, eliminate, or mitigate the adverse impacts of utility construction. Consideration of SUTs does not need to be limited to those described in the *Smart Utility Standards* or *Smart Utilities Policy*.