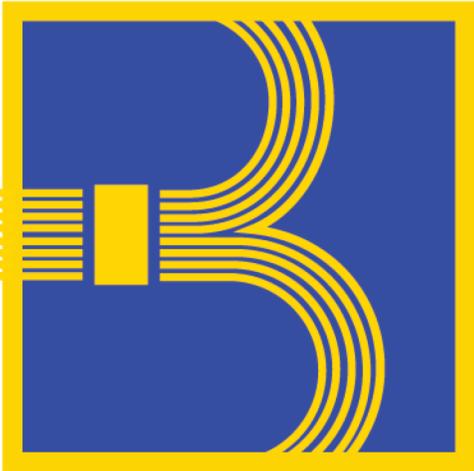


BOSTON SMART UTILITIES 2020 UPDATE



**BOSTON
SMART
UTILITIES**



City of Boston
Mayor Martin J. Walsh



**boston planning &
development agency**



Outline

- ❑ Overview of Boston Smart Utilities Program
- ❑ 2018 Pilot Policy: Assessment and Updates
- ❑ 2020 Policy: New Recommendations
- ❑ Q&A / Discussion

Boston Harbor

Nor'easter - March 1-3, 2018



Back Bay

Blackout - Scotia Street Substation



North End

Repetitive Street Openings



Boston Underground



Mass Ave.

Traffic Congestion



Mass Ave. & Beacon St.

Smart Sensors Pilot



BOSTON SMART UTILITIES (BSU) PROGRAM

- Provides **new model for upfront integrated utility planning & design**
 - Focuses on utilities across four sectors
 - Led by inter-departmental Steering Committee
- Encourages **deployment of Smart Utility Technologies (SUTs)**



GOALS



Efficiency
Make utilities easier to build, maintain and upgrade



Equity
Reduce utility costs for residents and businesses



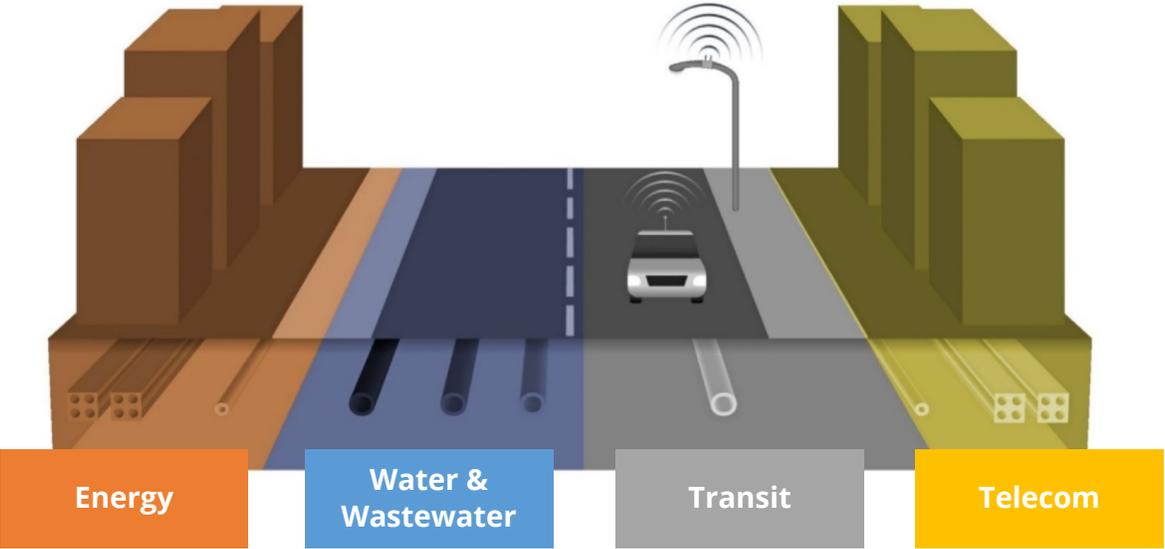
Resiliency
Harden infrastructure against flooding risk and heat waves



Economic Development
Attract businesses and jobs through world-class essential services



Innovation
Integrate cutting edge technologies and lead through innovation



BSU STEERING COMMITTEE

8 Agencies/Departments

Have met biweekly since 2016

John “Tad” Read

*Senior Deputy Director for
Transportation & Infrastructure Planning
Boston Planning & Development Agency*

Bryan Glascock

*Deputy Director for Regulatory Planning
and Zoning
Boston Planning & Development Agency*

Mary Knasas

*Senior Planner III
Boston Planning & Development Agency*

Manuel Esquivel

*Sr. Infrastructure & Energy Planner
Boston Planning & Development Agency*

Bradford Swing

*Director of Energy Policy and Programs
Mayor’s Office Environment, Energy,
and Open Space*

Amy Cording

*Interim Director of Engineering
Boston Transportation Department*

Irene McSweeney

*Chief of Operations
Boston Water and Sewer Commission*

Anne Schwieger

*Broadband and Digital Equity Advocate
Department of Innovation &
Technology*

Alison Brizius

*Director of Climate and
Environmental Planning
Environment Department*

Zachary Wassmouth

*Chief Design Engineer
Public Works Department*

Todd Liming

*Chief Engineer
Public Improvement Commission*

Nayeli Rodriguez

*Technologist for the Public Realm
Mayor’s Office of New Urban
Mechanics*

SMART UTILITIES POLICY FOR ARTICLE 80

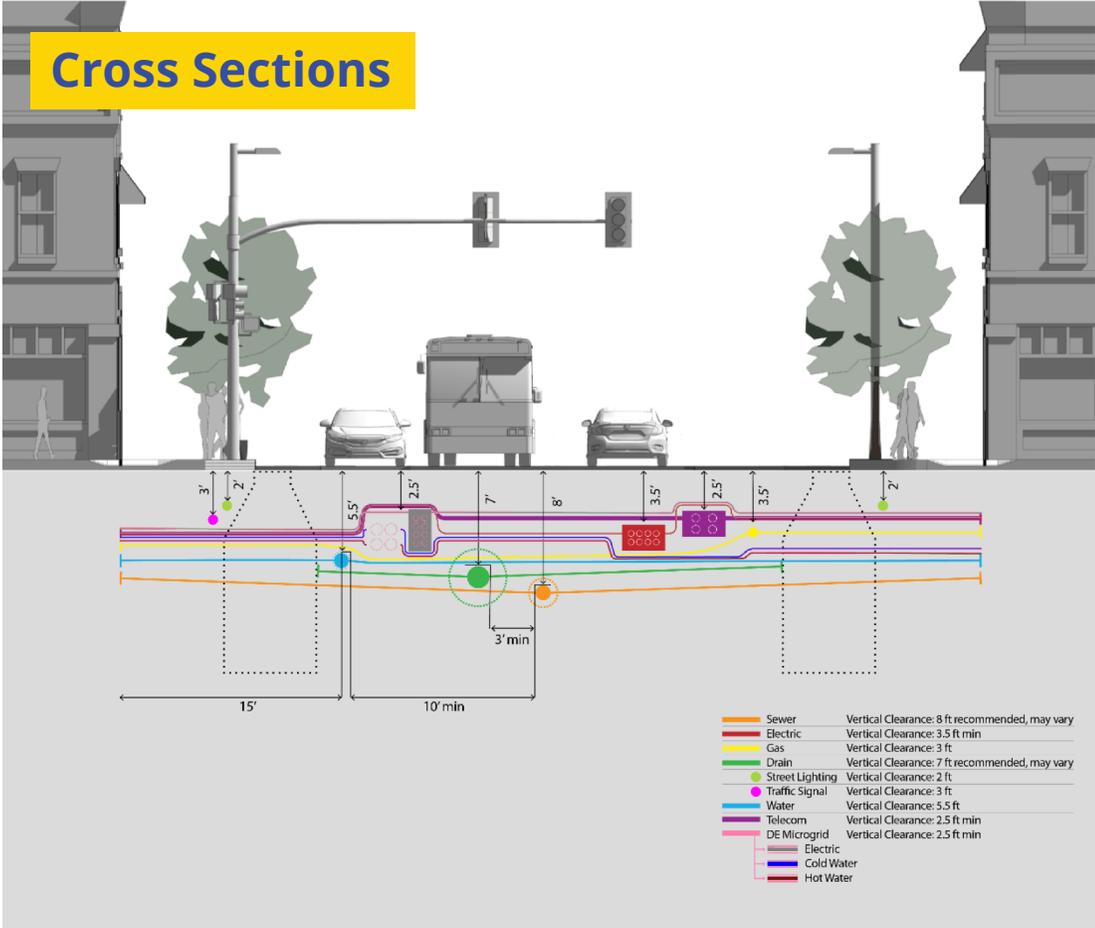
Adopted June 2018 as Pilot Policy

	Article 80 Size Threshold	Specifications
District Energy Microgrid	>1.5 million SF	Feasibility Assessment; if feasible, then Master Plan & District Energy Microgrid Ready design
Green Infrastructure	>100,000 SF	Install to retain 1.25" rainfall on impervious areas (Increase from 1" currently required by BWSC)
Adaptive Signal Tech.	All projects requiring signal installation or improvements	Install AST & related components into the traffic signal system network
Smart Street Lights	All Projects requiring street light installation or improvements	Install additional electrical connection & fiber optics at pole
Telecom Utilidor	>1.5M SF of Development, or >0.5 Miles of Roadway	Install Telecom Utilidor

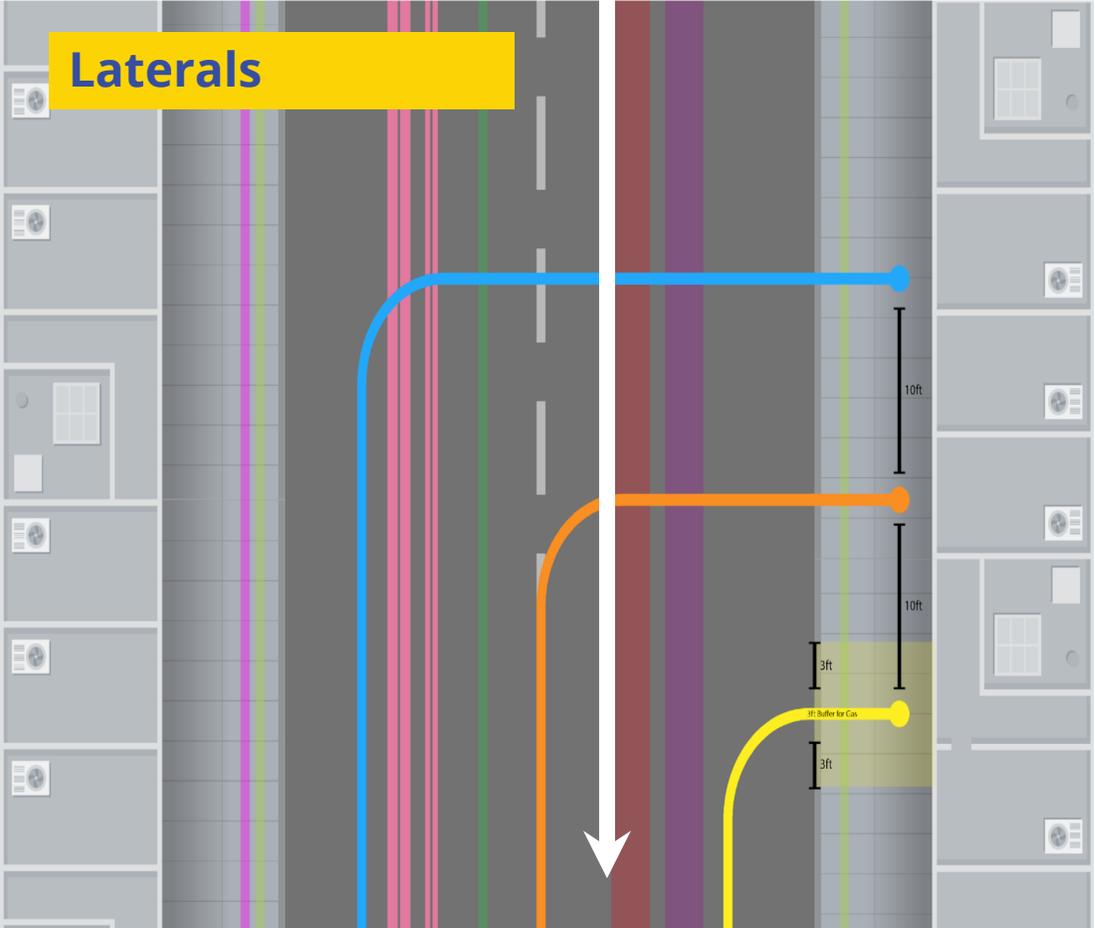
SMART UTILITY STANDARDS

Cross Sections and Laterals

Cross Sections



Laterals



Outline

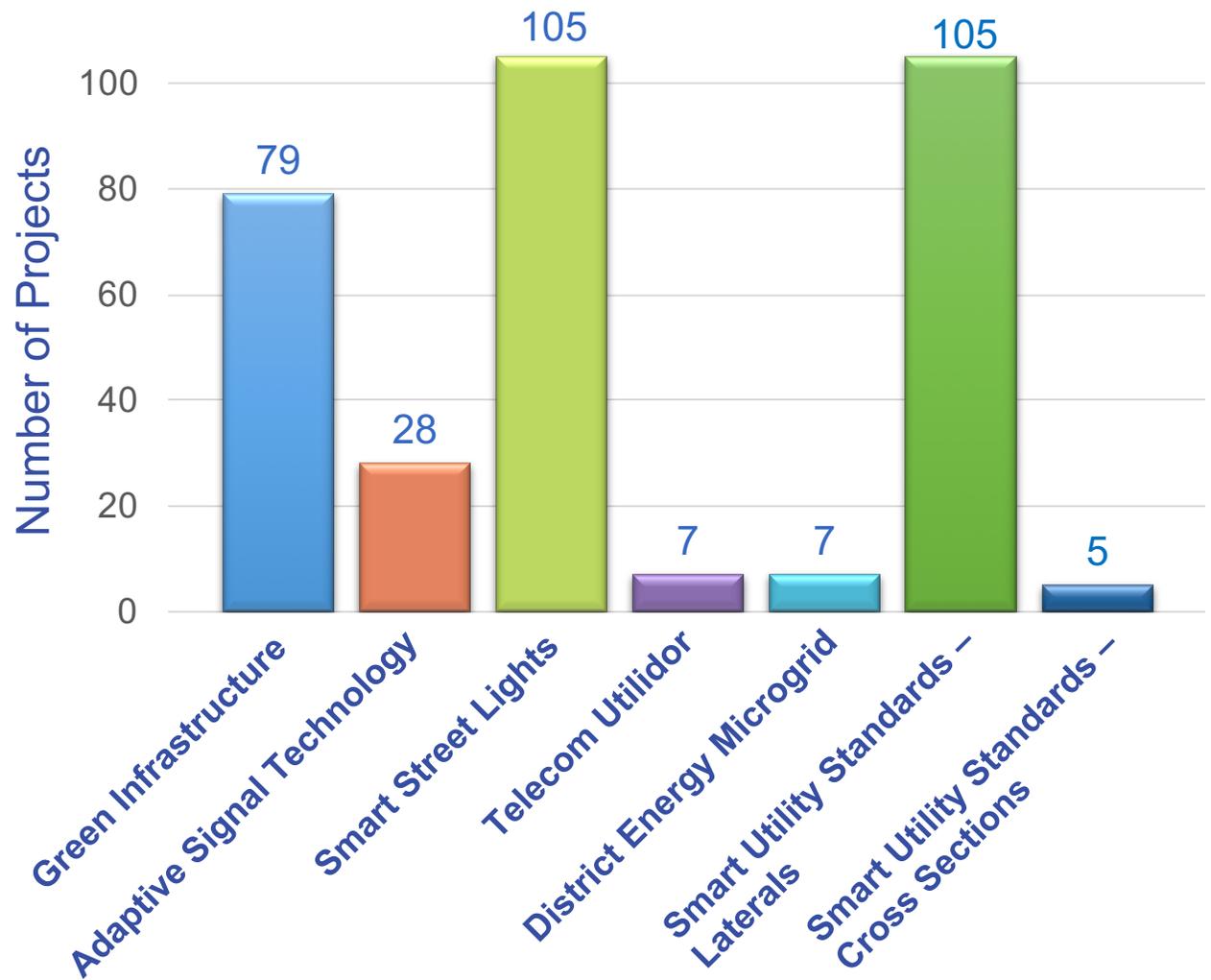
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OVERALL STATISTICS

Projects Reviewed Under Smart Utilities (2018-present)

	Number of Projects	Total Area of development (SF)
Under Review	61 (58%)	31,750,403
Board Approved	44 (42%)	25,936,032
Total	105	57,686,435

Projects Reviewed by Smart Utility Technology (SUT) and Standards (SUS) (2018-present)



SUTs ASSESSMENT AND UPDATE

Green Infrastructure	
Adaptive Signal Technology	
Smart Street Lights	
Telecom Utilidor	
District Energy Microgrid	

SUTs ASSESSMENT AND UPDATE



green

Green Infrastructure

- Current threshold: **>100,000 SF, install to retain 1.25" rainfall** on impervious areas (a 0.25" increase over the 1" BWSC baseline)
- Description: An **approach for water management** that uses infrastructure such as bioretention basins and permeable pavers to **mimic and restore natural processes**
- Benefits: Different types of GI provide different co-benefits, **such as stormwater retention, pollution control, and mitigation of urban heat island effect, etc.**

SUTs ASSESSMENT AND UPDATE

Green Infrastructure



Policy achieving increased stormwater retention and associated pollution control: **88,000 cu ft of additional stormwater capacity across 46 projects**

Need to incentivize other benefits of Green Infrastructure

Adaptive Signal Technology

Smart Street Lights

Telecom Utilidor

District Energy Microgrid

SUTs ASSESSMENT AND UPDATE

Green Infrastructure



>100,000 SF

Install to retain 1.25" rainfall on impervious areas
and use priority maps to promote other GI benefits

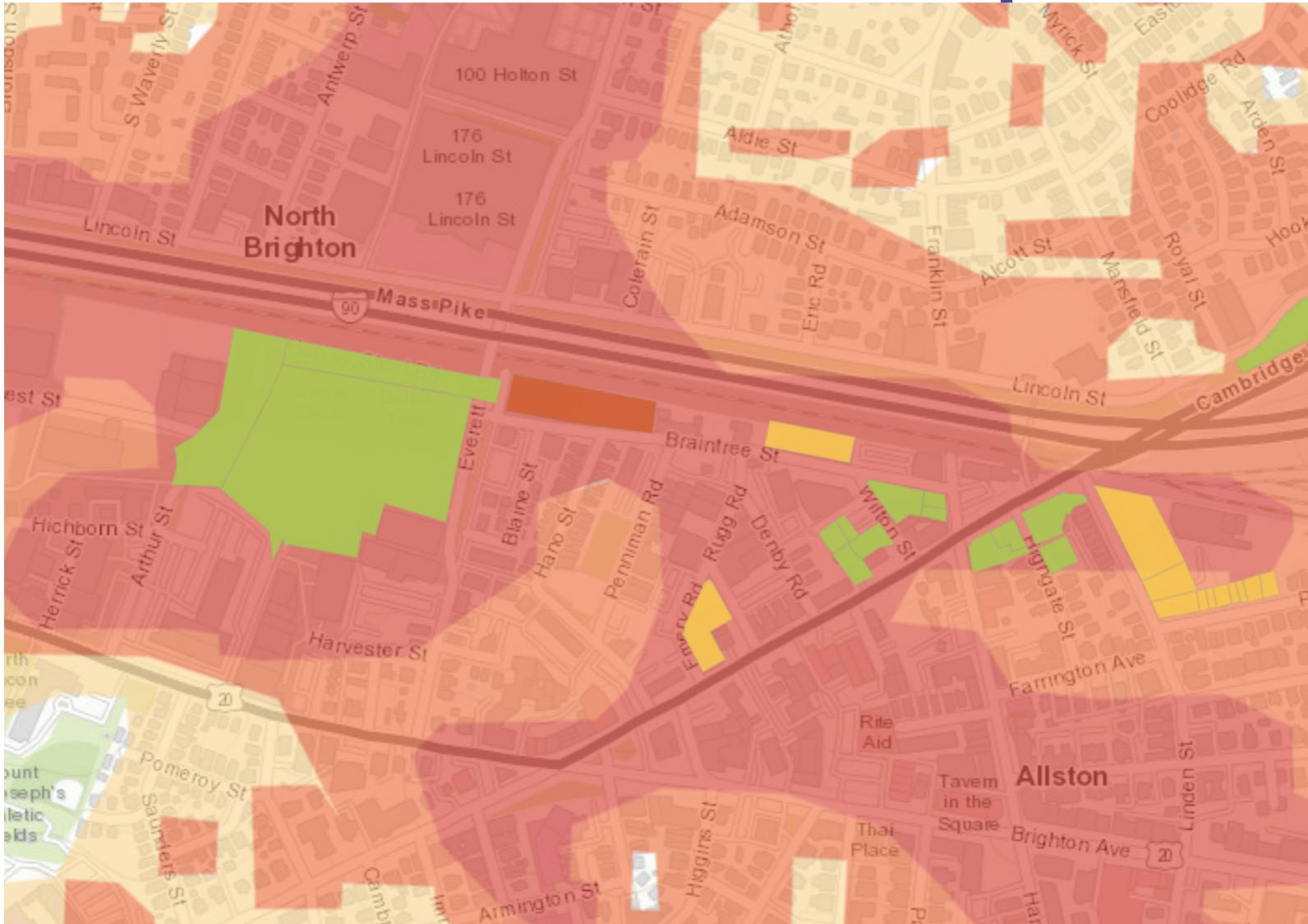
Adaptive Signal Technology

Smart Street Lights

Telecom Utilidor

District Energy Microgrid

Urban Heat Island Effect Maps



Article 80 Status

-  Pre-File
-  LOI
-  Under Review
-  Board Approved

Heat Island Effect

-  Moderate
-  High
-  Very High

SUTs ASSESSMENT AND UPDATE

Green Infrastructure



>100,000 SF

Install to retain 1.25" rainfall on impervious areas
and use priority maps to promote other GI benefits

Adaptive Signal Technology



Smart Street Lights

Telecom Utilidor

District Energy Microgrid

SUTs ASSESSMENT AND UPDATE



Adaptive Signal Technology (AST)

- Current threshold: any **project requiring traffic signal installation or improvements**, install AST and related components
- Description: Motion sensors and technology that create a **network of signals that communicate to improve traffic flow and safety**
- Benefits: Under **BSU we focus on** technology that provides benefits for **all modes of transportation**

SUTs ASSESSMENT AND UPDATE

Green Infrastructure



>100,000 SF

Install to retain 1.25" rainfall on impervious areas **and use priority maps to promote other GI benefits**

Adaptive Signal Technology



AST standards are forthcoming, based on Seaport District AST pilot program

Opportunity to integrate other technology and infrastructure for all modes, such as **unconnected traffic signals** and bus **Transit Signal Priority (TSP)** in corridors of interest

Smart Street Lights

Telecom Utilidor

District Energy Microgrid

SUTs ASSESSMENT AND UPDATE

<p>Green Infrastructure</p>		<p>>100,000 SF</p>	<p>Install to retain 1.25" rainfall on impervious areas and use priority maps to promote other GI benefits</p>
<p>Traffic, Transit, Bike & Ped Supporting Tech</p>		<p>If in corridor of interest, in coordination with BTD</p>	<p>Integrate technology and/or infrastructure (i.e., shadow conduit) to support interconnection of traffic signals, BRT TSP, AST, and/or other Active Transportation supportive technology</p>
<p>Smart Street Lights</p>			
<p>Telecom Utilidor</p>			
<p>District Energy Microgrid</p>			

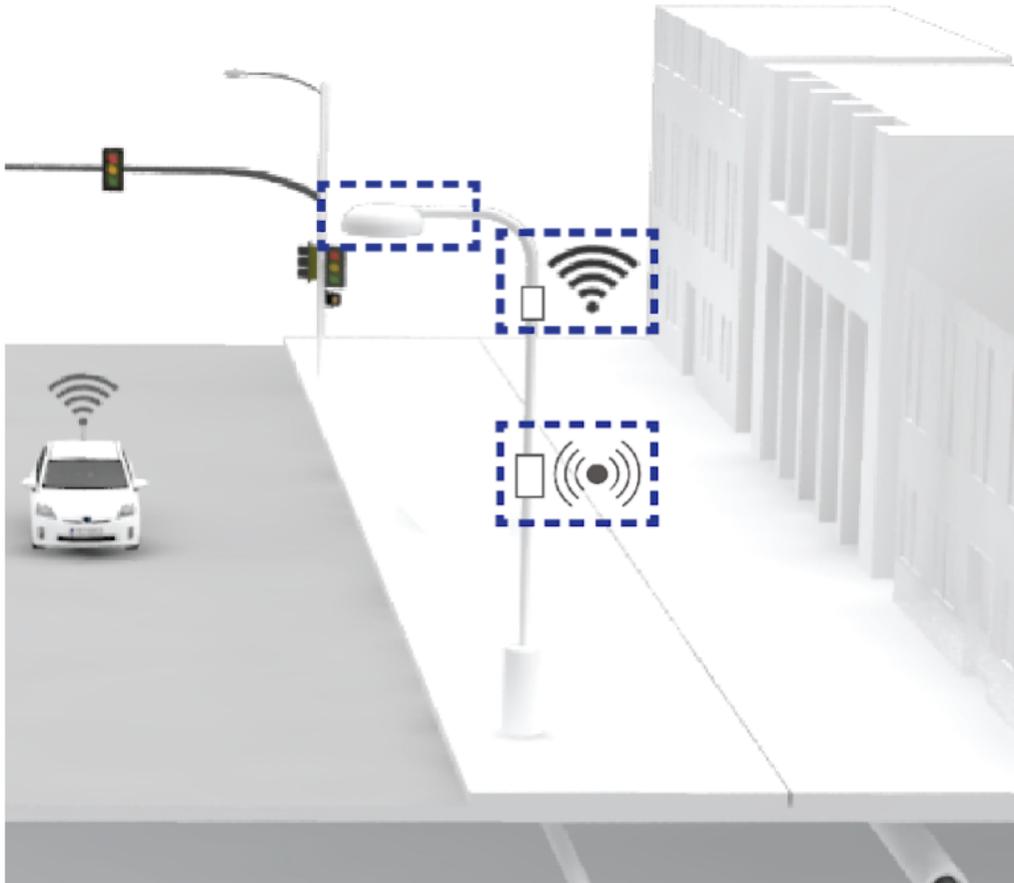
SUTs ASSESSMENT AND UPDATE

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<p>District Energy Microgrid</p>			

SUTs ASSESSMENT AND UPDATE

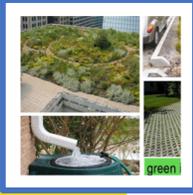
Smart Street Lights

- Current threshold: any **project requiring new street lights or improvements, install additional electric/fiber** at the pole
- Description: **Smart technology mounted on traditional light poles**, such as cameras, antennas, and sensors
- Benefits: Technology that supports **safety, enhancement of telecom services, traffic management, pollution control, etc.**



SUTs ASSESSMENT AND UPDATE

Green Infrastructure



>100,000 SF

Install to retain 1.25" rainfall on impervious areas
and use priority maps to promote other GI benefits

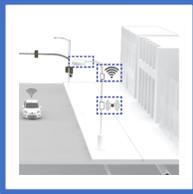
Traffic, Transit, Bike & Ped Supporting Tech



If in corridor of interest, in coordination with BTD

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Smart Street Lights

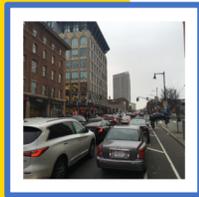
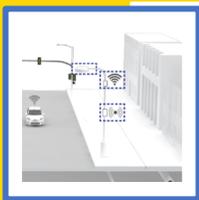


Do not need to depend in installation of new light poles, but can instead **focus on projects with significant sidewalk reconstruction**

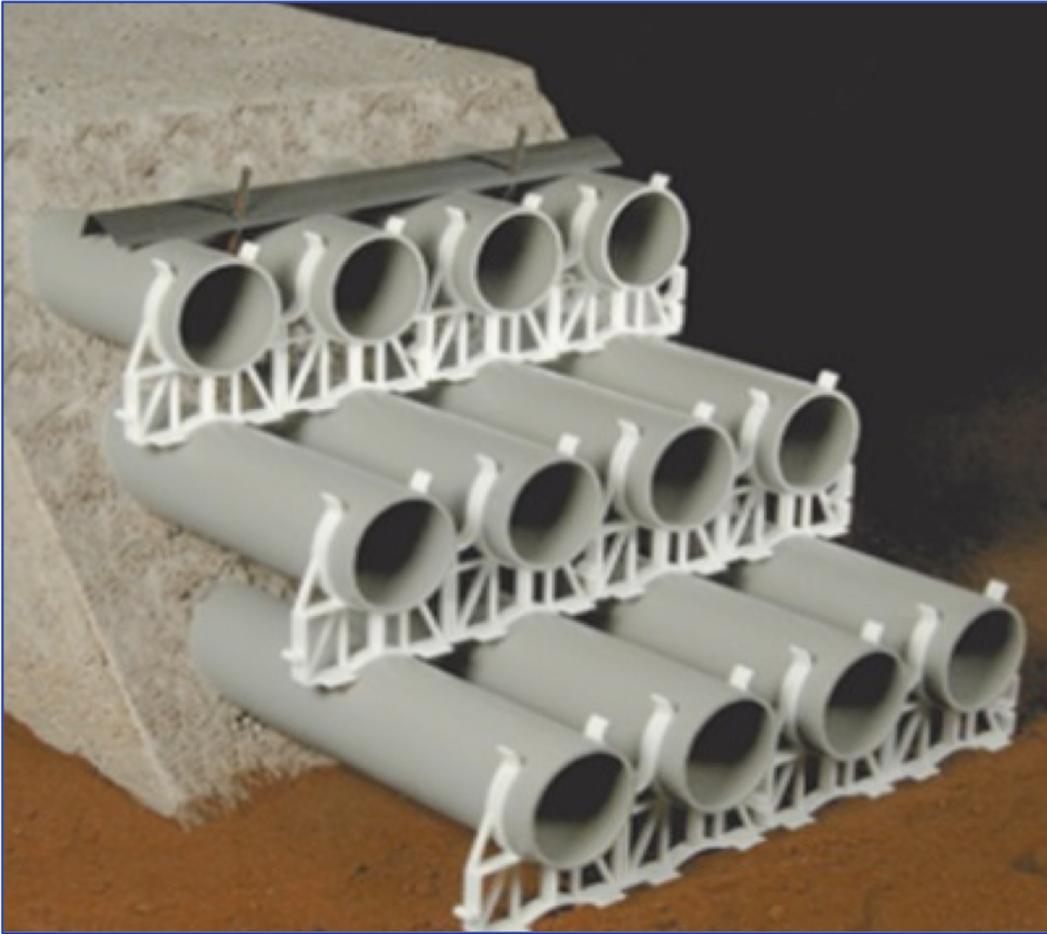
Telecom Utilidor

District Energy Microgrid

SUTs ASSESSMENT AND UPDATE

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<p>Smart Street Lights</p>		<p>If significant sidewalk reconstruction, in coordination with PIC and PWD</p>	<p>Lay out additional fiber and electric shadow conduit on sidewalks</p>
<p>Telecom Utilidor</p>			
<p>District Energy Microgrid</p>			

SUTs ASSESSMENT AND UPDATE

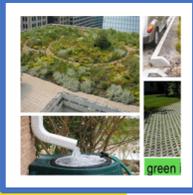


Telecom Utilidor

- Current threshold: **>1.5M SF** of development *or* **>0.5 Miles of roadway**
- Description: A **duct bank with increased capacity for telecom** service
- Benefits: **Mitigates repetitive street openings** when installation of telecom service is required

SUTs ASSESSMENT AND UPDATE

Green Infrastructure



>100,000 SF

Install to retain 1.25" rainfall on impervious areas
and use priority maps to promote other GI benefits

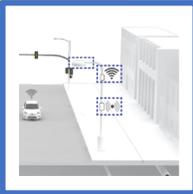
Traffic, Transit, Bike & Ped Supporting Tech



If in corridor of interest, in coordination with BTD

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Smart Street Lights



If significant sidewalk reconstruction, in coordination with PIC and PWD

Lay out additional fiber and electric shadow conduit on sidewalks

Telecom Utilidor



Collaborating with proponents on design characteristics (i.e., number of ducts & manholes)

Opportunity to coordinate **at lower thresholds in corridors/areas of interest, if within scope of work** (i.e., in coordination with neighborhood planning initiatives)

District Energy Microgrid

SUTs ASSESSMENT AND UPDATE

Green Infrastructure



>100,000 SF

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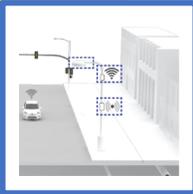
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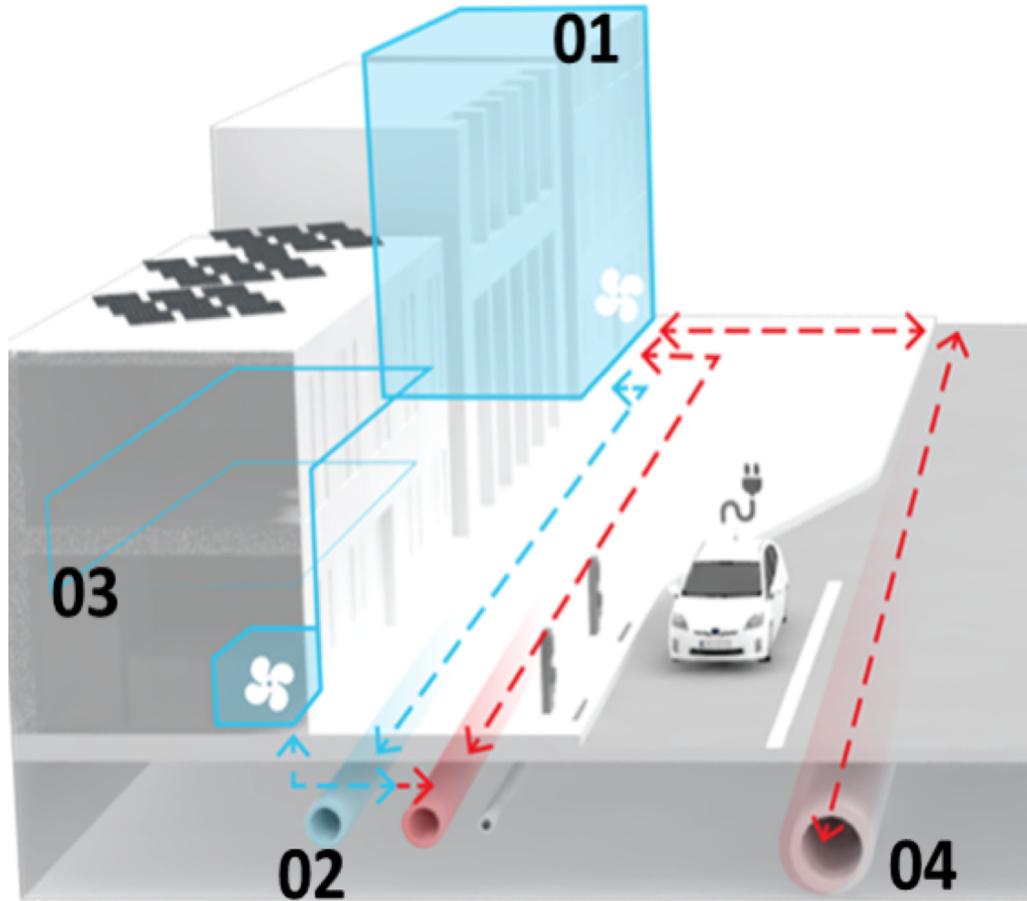
>1.5M SF of Development, or
>0.5 Miles of Roadway, **or**
< 1.5 million SF in priority corridor

Install Telecom Utilidor **on applicable streets**

District Energy Microgrid



SUTs ASSESSMENT AND UPDATE

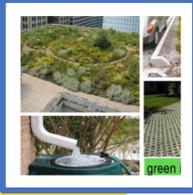


District Energy Microgrid

- Current threshold: > **1.5 million SF**, **Feasibility Assessment**; if feasible, then **Master Plan** & District Energy Microgrid Ready design
- Description: **Energy system for clusters of buildings** that provides localized thermal and/or electrical services
- Benefits: Opportunity to **decrease GHG emissions, decrease energy and O&M costs**, and **increase site energy resilience**

SUTs ASSESSMENT AND UPDATE

Green Infrastructure



>100,000 SF

Install to retain 1.25" rainfall on impervious areas **and use priority maps to promote other GI benefits**

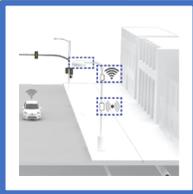
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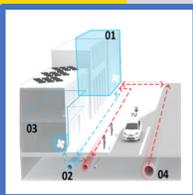
Telecom Utilidor



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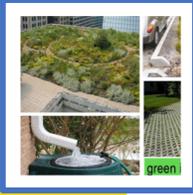
District Energy Microgrid



Feasibility Assessments have resulted in **different tailored solutions**, including **in-building cogeneration, district energy “ready” design, and rooftop PV + battery storage analysis**

SUTs ASSESSMENT AND UPDATE

Green Infrastructure



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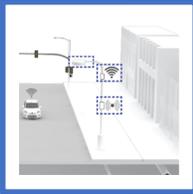
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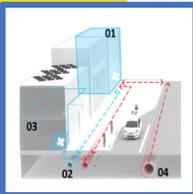
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Install Telecom Utilidor **on applicable streets**

District Energy Microgrid



> 1.5 million SF

Feasibility Assessment **for Advanced Energy Systems, in collaboration with Climate Action Plan (CAP) and Climate Ready Boston (CRB) teams**; if feasible, then Master Plan & District Energy Microgrid Ready design

Outline

- Overview of Boston Smart Utilities Program
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NEW SUTs ASSESSMENT AND RECOMMENDATIONS

Solar/Battery/ EV Microgrids	
Smart Broadband Buildings	

NEW SUTs ASSESSMENT AND RECOMMENDATIONS



Solar/Battery/EV Microgrids

- Description: **Energy systems for clusters of buildings**, integrated within a **defined boundary**, and **capable of disconnecting** and operating independently **from the macro electric grid**. Include power generation (i.e., rooftop PV) and distribution infrastructure (i.e., wires, control systems)
- Benefits: Opportunity to **decrease GHG emissions**, **decrease energy and O&M costs**, and **increase site energy resilience**

NEW SUTs ASSESSMENT AND RECOMMENDATIONS

**Solar/Battery/
EV Microgrids**



City departments and State agencies are spearheading policies **to support individual technologies** (i.e., solar incentives, BTD's EV Policy)

Opportunity to integrate low-cost microgrid "ready" design at the building and development site levels to avoid costly retrofits

**Smart
Broadband
Buildings**

NEW SUTs ASSESSMENT AND RECOMMENDATIONS

**Solar/Battery/
EV Microgrids**



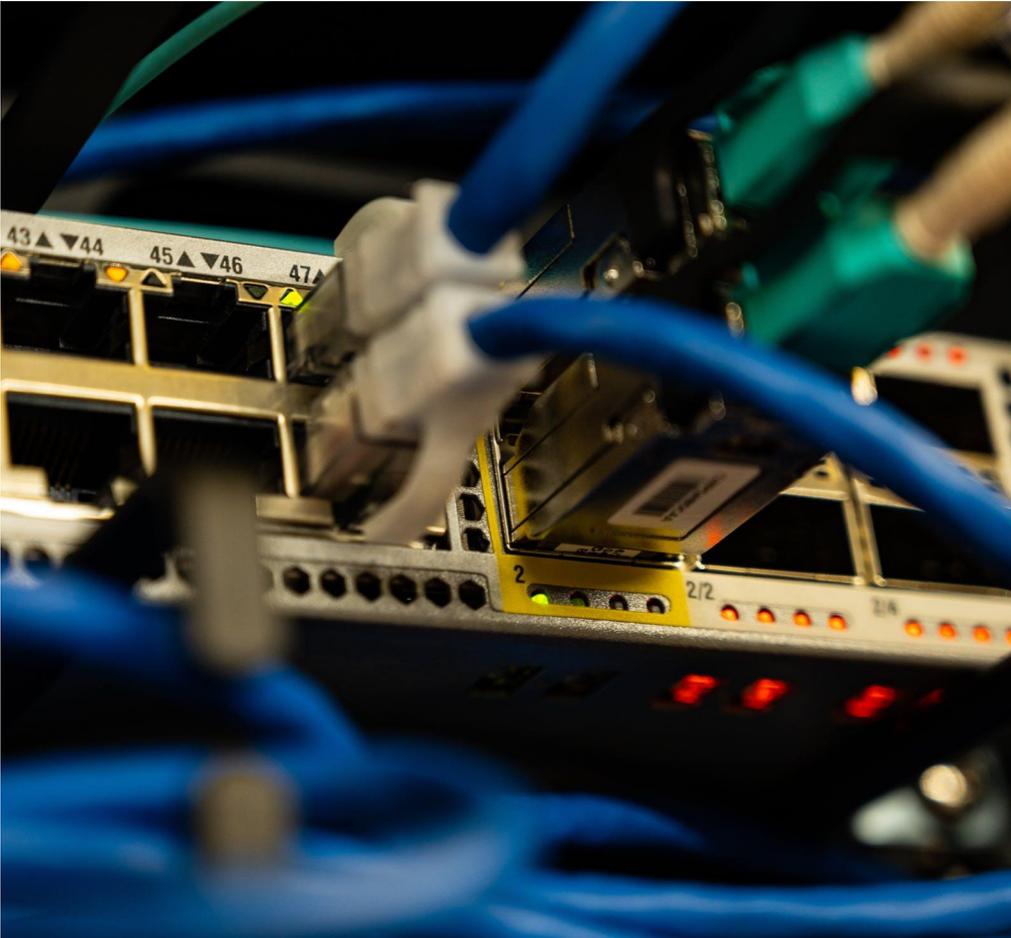
All Article 80 projects

Integrate "ready" design standards, guidelines, and best practices

**Smart
Broadband
Buildings**



NEW SUTs ASSESSMENT AND RECOMMENDATIONS



Smart Broadband Buildings

- Description: Building that deploy **standards and guidelines** to create a **broadband ecosystem** that serves the **current and future connectivity needs** of residents, businesses, institutions
- Benefits: **Enabling competition** in the telecom sector, **attracting world-class businesses** by ensuring “**ready**” design for **future** technologies, **mitigating street disruption**, etc.

NEW SUTs ASSESSMENT AND RECOMMENDATIONS

Solar/Battery/ EV Microgrids



All Article 80 projects

Integrate "ready" design standards, guidelines, and best practices

Smart Broadband Buildings



Broadband Ready Buildings Checklist already integrated into **Article 80 Development Review**, and supports goals of Smart Utilities

Opportunity to integrate low-cost broadband "ready" design at the building and development site levels and avoid costly retrofits

NEW SUTs ASSESSMENT AND RECOMMENDATIONS

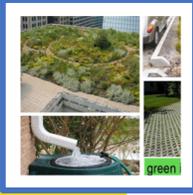
<p>Solar/Battery/ EV Microgrids</p> 	<p>All Article 80 projects</p>	<p>Integrate "ready" design standards, guidelines, and best practices</p>
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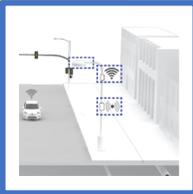
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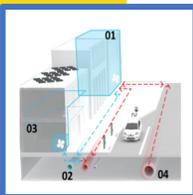
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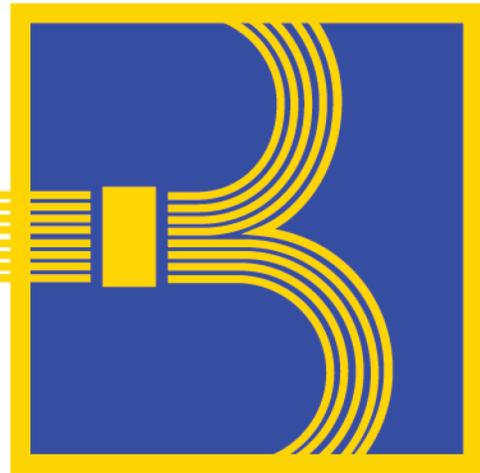
Install Telecom Utilidor **on applicable streets**

District Energy Microgrid



> 1.5 million SF

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BOSTON SMART UTILITIES



City of Boston
Mayor Martin J. Walsh



**boston planning &
development agency**

